

"GRAVE CONSEQUENCES"

Japan's Plea for a Nominal Privilege

The Aftermath of Exclusion

American Opinion Scores the Senate

WHAT IS AMERICA AFTER IN THE FAR EAST?

Baron Hikokichi Ijuin.

TRAMWAY DEVELOPMENTS IN EASTERN ASIA

ELECTRIC LOCOMOTIVES IN JAPAN

PIPE LINE AT GOPENG

HONGKONG AT WEMBLEY

TAIKOO AND HONGKONG & WHAMPOA

DOCKYARDS

SHANGHAI PORTLAND CEMENT WORKS

上海仁記路第五號

遠東時報

Vol. XX

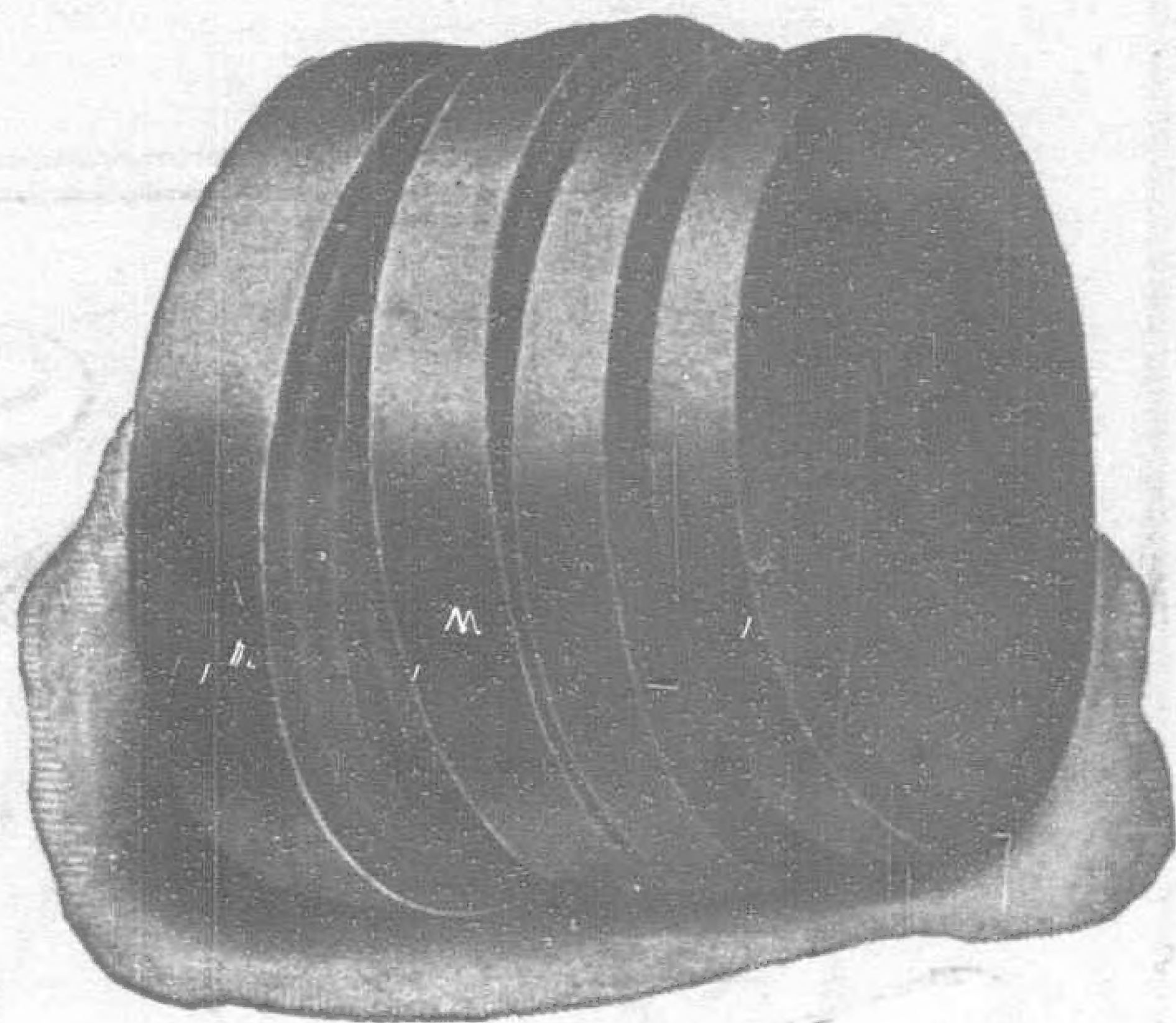
May, 1924

No. 5



Ready for Immediate Delivery

STAR BRAND LEATHER BELTING



Complete Stocks Carried by

THE KOSTER COMPANY

12 Nanking Road, Shanghai

Cable Address: "KOSTER." All Codes

Manufactured by

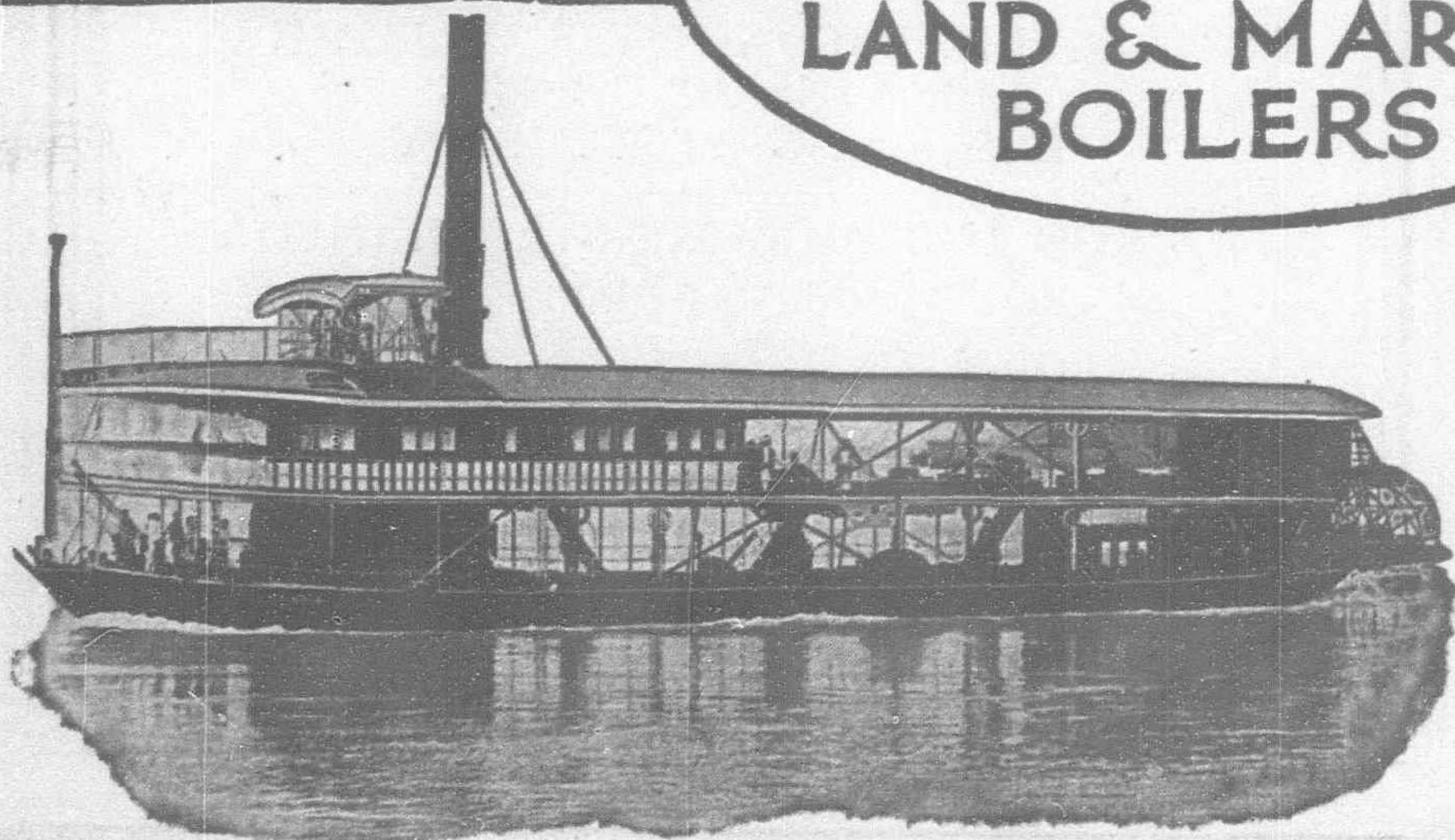
L. P. DEGEN BELTING COMPANY

San Francisco, U.S.A.

YARROW

& CO (1922) LTD
GLASGOW

for
PASSENGER & CARGO
STEAMERS
SHALLOW DRAFT VESSELS
LAND & MARINE
BOILERS



The Far Eastern Review

ENGINEERING

FINANCE

COMMERCE

VOL. XX

SHANGHAI, MAY, 1924

No. 5

"Grave Consequences"

"Relying upon the confidence you have been good enough to show me at all times, I have stated or rather repeated all this to you very candidly and in a most friendly spirit, for I realize, as I believe you do, the grave consequences which the enactment of the measure retaining that particular provision (*the Japanese exclusion. Editor*) would inevitably bring upon the otherwise happy and mutually advantageous relations between our two countries."

THE words contained in the above extract from a note addressed under date of April 10 to Secretary Hughes by Ambassador Hanihara were interpreted by the American senate as a veiled threat and that august body without more ado passed the bill which definitely excludes Japanese immigrants from the United States even under a quota law which would have preserved their national dignity without material injury to American interests. It required a very sensitive mind to read into the above note an affront after all that had gone before in the relations between Japan and America these past five years. A concealed threat was furthest from the mind of Japan's ambassador and he hastened to correct the wrong impression by an immediate explanation of words which have become associated in diplomatic intercourse as a precursor to hostilities. That such a construction should have been placed on these words after Japan's whole-hearted efforts to gain the good-will and esteem of America would indicate that our legislators are deplorably ignorant of basic Asiatic problems.

Used as a threat, the words "grave consequences" could produce only the effect they did. It was an unfortunate selection of words. "Far reaching" would have sounded better and conveyed the same meaning. No self-respecting government will tolerate outside interference in what it considers a purely domestic question, so when the senate hastened to call what it considered as Japan's bluff, it did what was entirely proper. A better knowledge of present-day Japan and her fundamental problems, however, would have told the senate that far from concealing a threat, Ambassador Hanihara's phrase very mildly pointed to the inevitable aftermath an unwarranted affront to Japan must have on American policies, trade and cultural aspirations in the Far East.

Few of our public men realize the great sacrifices Japan has made to gain our friendship and work with us for the advancement of mutual policies in the Orient. Few understand the pressing population problem of Japan which may drive her in self-defense to seek an independent agreement with China based on the abolition of her

extra-territorial rights in this country. This, in itself, is one of the grave consequences that may legitimately follow the application of the Japanese exclusion law. Such action on the part of Japan would hasten the end of the "open door" doctrine, deprive America of that shadowy leadership in China upon which its Far Eastern policies are founded and usher in a new era in Asia. Some one of the great powers must take the initiative in restoring to China full sovereignty over their nationals. Already the edifice of extra-territoriality is tottering. It does not require any great political prescience to sense that if Japan is affronted and rejected by the West and the truth is brought home to her people that they can never hope for full recognition of their claim to equality, a revulsion of feeling will sweep over the empire that must inevitably lead to the formulation of new policies and a new outlook upon the future.

If the West in its might lays down and enforces the doctrine that "East is East and West is West and never the twain shall meet," except in commerce, then the West must not grumble or become alarmed if the East remains East and combines its forces for the preservation of a civilization that is as dear to them as that of the West to the West. When the West bars out the East and then erects barriers in the East which circumscribe the national expansion and legitimate aspirations of any part of the East, the consequences in the long run can only be grave. So, when the West as typified by America, closes its doors to Chinese and Japanese and follows them up in their own legitimate sphere and bars them from the Philippines (teaching one Asiatic that he is better than another) when Japan is obstructed from protecting her vital strategic and economic interests in Manchuria; when America acts as a self-constituted policeman to keep Japan out of Siberia, while acquiescing in Russia's absorption of Mongolia and expansion in Central Asia, sooner or later the truth will be borne home to the East that the issue disguised for the present under economic exclusion laws is in reality an intense racial hatred based on cultural, religious and color lines.

The effect of all this will be to unite China and Japan for the preservation of their common civilization and their right to



Japan's Ambassador to the United States, Masanao Hanihara, whose open and frank note to Secretary Hughes was interpreted by the Senate as a Veiled Threat

exist. The West, represented by America, overlooks the real China. It forgets the Chinese are as proud and haughty as they ever were in the old exclusion days of the Manchus. It ignores that the Chinese are nursing the same grievance as Japan, deeply resenting the indignities heaped upon their travelers by the rigid application of Western exclusion laws. Any American who cherishes the idea that by forcing philanthropies upon the Chinese we will drive a wedge between the two great Oriental nations, is a fit inmate for the insane asylum. There are few differences between the Chinese and Japanese that cannot be readily compounded. China's so-called national humiliation day has already lost its significance. The two nations cannot always be kept apart.

Dr. Sun Yat-sen knows China and speaks for a vast percentage of his people. Discussing Japanese policies towards China, he recently told the writer:

"I am a friend and admirer of Japan. The Chinese look upon Japan as a younger brother who has strayed from the older civilization in order to court favor and prestige from the West. The West has accorded her the rank of a first class world power,

and instead of standing by their elder brother in his struggles to advance, Japan has aligned herself with his enemies. Some day, Japan will be disillusioned and turn to that brother she has injured and left behind in the race for power. When that day arrives and Japan returns to the family prepared to work in harmony with it, all will be forgiven."

Dr. Sun may be a dreamer but his dreams have an uncanny habit of coming true. The day when the younger brother of China will return to the family he has out-distanced in the race for power, is brought appreciably nearer by the enactment of the American exclusion law. The union of China and Japan for the preservation of their common civilization and right to exist is an inevitable as the rising of the sun in the East. If these consequences convey a threat to the West, the latter has only itself to blame.

Japan has already decided upon her future attitude towards China. No longer will she act as the policeman of the powers for the protection of foreign interests in this country. Never again will she be placed in the position of infringing China's sovereignty or of taking any initiative that may lead to intervention in her affairs.

She has her own plans for the development of cultural relations with China and only continued unrest in this country has retarded their being placed into practice.

In carrying out this cultural program, the two nations will become spiritually united and facilitate co-operation in material undertakings. Japan's civilization had its source in China and it is with a hope that the two peoples will once more become united for the preservation of common ideals that Japan is now willing to remit her share of the Boxer indemnity for schools, colleges, hospitals, libraries and the expenses of maintaining Chinese students in Tokyo. The idea of co-existence and co-prosperity is to be inculcated in the minds of the Chinese who are ready to acclaim Japan as a brother on whom they can rely to stand with them in the joint labors of developing anew that civilization which at one time dominated the world. It may never again rule the world, but it is a foregone conclusion that in due time it will be paramount in its own sphere.

If this means anything at all, it means an end to America's aspirations to spiritual leadership in China; the end of the "open door" doctrine; an intensification of the struggle for trade opportunities; the revival of jealousies, friction and hatred that will undo the work of the Washington conference. Our contributions for uplift work in China will go for naught. All this will not come about in a day or a year. Japan will remain a friend of America. New parties will come into power and new policies supplant those now in force, but down deep in the heart of every Japanese will rankle the knowledge that Americans have classed them as inferiors unfit to enter their great country on a basis of equality with other peoples far less desirable than they. It may be many years before America, like Germany and Russia, will be reminded of the insult. How and when that opportunity will arise, only the future will disclose, but it will be done in a manner as firmly and politely as we are now rubbing it in to Japan. But come it will, and on Japan's willingness to forget the affront may hinge the future of Western civilization.



Viscount K. Kiyoura, Japan's Prime Minister, who accepts full responsibility for Ambassador Hanihara's much criticized note to Secretary Hughes



Baron K. Matsui, Japan's Minister for Foreign Affairs

Japan's Plea for a Nominal Privilege

Friendship With America Impaired but Not Broken

IN order to clearly understand how mistaken is the interpretation placed on Ambassador Hanihara's note to the secretary of state by the senate, it is only necessary to go back to other Japanese official statements regarding the immigration issue. Ambassador Hanihara's note was dated April 10. Read the following statement given to the Associated Press by Baron Matsui on February 7:—"Japan's continued development and security, in a large measure," he says "depend upon the maintenance of good relations with the United States—as well as others. This is not only a present and temporary need but one that Japan will require as far as we can see into the future." Such words from Japan's foreign minister adequately interpret her real sentiments.

BARON MATSUI TO THE ASSOCIATED PRESS, FEBRUARY 7, 1924.

"Of course, we are disturbed over the increasing restrictions put upon Japanese residents in the United States and the proposals at present before congress for the further exclusion of Japanese. Discriminatory and seemingly relentless opposition on the part of some Americans to the presence of a comparatively small number of our people is difficult for us to understand, and hard for us to reconcile either with our own sense of proper dignity or our appreciation of the fine principles for which the American people generally stand."

"Being particularly anxious for American good-will, we have gone a long way in many matters to meet the American point of view. Apart from any sentiment that we have, we fully realize that accord and understanding with the United States are of incalculable value. Our continued development and security, in a large measure, depend upon the maintenance of good relations with your country, as well as others; and this is not only a present and temporary need but one that Japan will require as far as we can see into the future. Here we live by overseas trade, and the United States is at once our greatest customer and our greatest source of supplies."

"In the wisdom of this policy of close understanding and co-operation our whole country concurs; and, in the notably good developments that have been achieved between us in the last few years, Japan is overwhelmingly gratified. Moreover, our hearts have been touched deeply and enduringly by the spontaneous sympathy and extensive generosity your people displayed towards ours after our recent terrible earthquake and fire. We have only this one regrettable issue between us, and it is an issue in which we have never been arbitrary, and do not now intend to make any unreasonable demand. We seek only to obtain fair treatment and humane consideration for a group of our people legitimately residing in your country; and this is no more than any self-respecting nation would do. The question of emigration from Japan to the United States has been definitely decided. For a number of years, knowing that our people were not wanted as immigrants, we have issued no passports except to the immediate relatives of those Japanese who have been long residents in the United States; and, in our opinion, this is a mere matter of humane consideration for the family rights of men. If this is deemed unsatisfactory, we are ready to discuss the matter anew. Restrictions or exclusions should be arranged by mutual consideration, consent, and agreement, as is customary, and not by needlessly arbitrary and *ex parte* action."

"Our foreign policies are obvious and well known to any who will observe and understand them, and our intentions in this special case are so conciliatory and well-meaning that we could only deem it an unnecessary lack of consideration if no heed is paid to our desire to be treated on the footing of other independent nations who are likewise playing important and valuable parts in the welfare and progress of mankind and in the maintenance of world peace."

Japan's Sacrifices for Friendship

Two months later, on April 15, Baron Matsui gave another interview to the American newspaper correspondents in Tokyo and once more voiced the universal feeling in Japan towards the proposal to exclude Japanese from entering the United States on a plane of equality with other nations. One point stands out clearly. "*For many years and sometimes at considerable sacrifice, we Japanese, both in government circles and privately, have made the utmost effort to develop friendship with the United States.*" That is a true statement, one which is reflected in the trade returns which show that Japan is the greatest purchaser of our products in Asia, greater than all other countries in the Far East combined. Some Americans like to fancy that there is nothing extraordinary in this, that they have the goods quote the lowest prices and therefore receive the orders. It would surprise them to learn of the many large orders that have gone to America out of pure sentiment, in order to gain its good-will.

In this statement, Baron Matsui points out a truth that also is overlooked by many. The United States in her present position

of wealth and power are privileged to take arbitrary action or behave with fine magnanimity. We can insult at this time whom we will with impunity, but we cannot wipe out resentment with fine words and phrases. The insult will rankle and even though for as many years as we can see into the future, Japan will carry on a relationship that means economic life or death to her, always hoping for some action that will wipe out the affront to her dignity, some day in some way she will return the compliment.

BARON MATSUI TO NEWSPAPER CORRESPONDENTS, APRIL 15, 1924.

"There is not much that I can say in complying with various requests for an interview. But this I want to do; I want to appeal against the final passage of the proposal designed to exclude Japanese. For many years and sometimes at considerable sacrifice we Japanese, both in government circles and privately, have made the utmost effort to develop friendship with the United States. We have never given up hope or belief that this very clear and worthy policy would be successful: nor have we given up now. Now, however, we have cause for grave anxiety, and it is for that reason that I make this appeal through you gentlemen of the American press. It seems to us that we are appealing only against an action that can wound us to some extent and can bring little satisfaction to you."

"There can be little doubt that if the quota provision is operated by American authorities on your side and the gentlemen's agreement is operated by us here, the most effective control over emigration will be provided. The choosing of those few of our people who would thus be permitted in future to go to American shores, the restraining of others, and the effecting of this supervision with the least possible irritation to either side is valuable assistance which we have to offer. Such an arrangement would maintain that mutual confidence, respect, and good-will which now exists and which we, as a nation as well as a government, are most anxious to retain and to continue successfully to promote."

"It is certainly of practical and we hope mutual benefit to keep our nations in friendly accord rather than in agreement based only on mutual interests. Our interests are closely linked with yours. You are our greatest customer, taking about forty per cent. of our annual exports, and we are a greater purchaser of your goods than all the rest of the Far East combined. This, together with our mutual political and sentimental interests in the stability and security of the Pacific nations, forms a relationship that cannot be broken; and to maintain it with greater and not with minor mutual regard is our earnest desire."

"Being the most wealthy and most secure among the nations, the United States is regarded with careful attention by the East no less than by the West. You are in the enviable position of a power privileged to take arbitrary action or to behave with fine magnanimity, setting an example to other nations or inducing their resentment. Because of your teachings in the mission fields of the East you have come to be highly regarded as one of the greater Christian nations. Within recent years we in Japan have been deeply affected by two notable actions on your part: First, the proposal to limit naval armament, an offer which you alone could make to the world out of your supremacy; secondly, the splendid and spontaneous sympathy which you displayed towards us at the time of our recent awful disaster."

"If now we get from you an experience of a different character, it will undo some of that spirit of friendship and esteem in which we have been happy long to regard you. It can do no more than this: but with a nation of the character of yours, the regard of others is, we believe, a consideration of no mean importance."

Japan Asks Only a Concession

The day following Baron Matsui's frank exposition of Japan's viewpoint, the prime minister gave an interview to the newspaper correspondents in Tokyo, in which he pleaded for a nominal privilege, a concession to Japan's pride that will preserve her face amongst the nations of the world. In it, he touches on a point which throws the lime-light on the handicaps which confront Japan in making her case clear in a language which few Japanese are proficient enough in to express their thoughts. It has always been one of the weak spots in Japan's much criticized publicity methods. An ingrained reticence, the result of centuries of feudal life, cannot be discarded in a generation or so. Viscount Kiyoura is right when he asks indulgence for this trait in the Japanese character. It is difficult, however, to see how the Japanese could have made their case any clearer.

THE PRIME MINISTER TO NEWSPAPER CORRESPONDENTS, APRIL 16, 1924.

"My regret is, of course, deep that the congress of the United States has seen fit to deal with us Japanese so drastically. It seems to us hardly to have been necessary in view of the fact that our whole history has shown us willing to be reasonable. We were willing to accept only a nominal privilege. If

we have not made this clear in a language which is foreign to us, we have at any rate shown it by that long record of action and of friendship which may now be impaired but cannot be broken. The right of the United States to arrange its own immigration is not disputed by us. We asked only for a concession. If this is denied us, we shall regret it, because we had hoped for a further act of consideration to be added to the several which your nation has shown us on former occasions. You gave us moral and financial support in the greatest crisis in our history and you gave us impressive sympathy in our greatest disaster. These things we shall not forget."

Senate Rejects Open Diplomacy

Probably in the long history of diplomacy there has never been recorded a more sincere regret for an error of speech than the note addressed to Secretary Hughes by Ambassador Hanihara on April 17. In it, he explains what he meant by the words "grave consequences," and when one is able to read between the lines and grasp all that an impairment of the mutual regard and confidence between Japan and America signifies, it must be confessed that the Japanese ambassador did not express himself forcibly enough. We have asked and fought for open diplomacy, yet when diplomatic intercourse is carried on in a spirit of sincere respect, confidence and candor, our Senate, which should be the last legislative body in the world to jump to hasty conclusions, seizes on frank statements in order to justify an affront that is daily becoming more evident was intended from the first.

It is significant that the secretary of state saw no offense in the wording of Ambassador Hanihara's note. It was only when this document reached the senate that a veiled threat was discovered in its wording, all of which goes to emphasize that post-war open diplomacy as conducted by the department of state is as yet incomprehensible to a group of legislators whose minds still function along lines peculiar to those whose usefulness reached its climax two generations ago.

NOTE ADDRESSED TO SECRETARY OF STATE HUGHES BY AMBASSADOR HANIHARA ON APRIL 17.

"In reading the congressional record of April 14, 1924, I find that the letter I addressed to you on April 10, a copy of which you sent to the chairman of the senate committee on immigration, was made a subject of discussion in the senate."

"In the record it is reported that some of the senators expressed the opinion which was apparently accepted by many other members of that body that my letter contained 'a veiled threat.' As it appears from the record that it is the phrase 'grave consequences' which I used in the concluding part of my letter that some of the senators construed as 'a veiled threat,' I may be permitted to quote here full text of the sentence which contained the words in question."

"Relying upon the confidence you have been good enough to show me at all times, I have stated or rather repeated all this to you very candidly and in a most friendly spirit, for I realize, as I believe you do, that grave consequences which the enactment of the measure retaining that particular provision would inevitably bring upon the otherwise happy and mutually advantageous relations between our two countries."

"Frankly I must say I am unable to understand how the two words read in their context could be construed as meaning anything like a threat. I simply tried to emphasize the most unfortunate and deplorable effect upon our traditional friendship which might result from the adoption of a particular

clause in the proposed measure. It would seriously impair the good and mutually helpful relationship and disturb the spirit of mutual regard and confidence whatever characterizes our intercourse of the last three-quarters of a century and which was considerably strengthened by the Washington conference, as well as by the most magnanimous sympathy shown by your people in the recent calamity in my country. Whereas there is otherwise every promise of hearty co-operation between Japan and the United States of America which is believed to be essential to the welfare not only of themselves but of the rest of the world it would create or at least tend to create an unhappy atmosphere of ill-feeling and misgiving over the relations between our two countries."

"As the representative of my country whose supreme duty is to maintain and if possible to draw still closer the bond of friendship so happily existing between our two peoples, I honestly believe such effects as I have described to be 'grave consequences.' In using these words which I did quite ingenuously, I had no thought of being in any way disagreeable or discourteous and still less of conveying 'a veiled threat.' On the contrary, it was in a spirit of the most sincere respect, confidence and candor that I used these words which spirit I hope is manifest throughout my entire letter; for it was in that spirit that I wrote you. I never suspected that these words used as I used them would ever afford an occasion for such comment or interpretation as has been given them."

"You know I am sure that nothing could be farther from my thought than to give cause for offence to your people or their government and I have not the slightest doubt that you have no such misunderstanding as to either the spirit in which I wrote the letter in question to you or the meaning I intended for the phrase that I used."

In view, however, of what has transpired in the course of the public discussion in the senate, I feel constrained to write you as a matter of record that I did not use the phrase in question in such sense as has been attributed to it.

REPLY OF SECRETARY OF STATE HUGHES TO AMBASSADOR HANIHARA ON APRIL 18.

"I am gratified to receive your letter of the 17th instant with your frank and friendly explanation of the intent of your recent note in relation to the pending immigration bill."

"It gives me pleasure to be able to assure you that reading the words 'grave consequences' in the light of their context, and knowing the spirit of friendship and understanding you have always manifested in our long association, I had no doubt that these words were to be taken in the sense you have stated, and I was quite sure that it was far from your thought to express or imply any threat. I am happy to add that I have deeply appreciated your constant desire to promote the most cordial relations between the peoples of the two countries."

The American secretary of state, the American ambassador at Tokyo, the president of the United States and other powerful influences throughout the country have labored to the best of their ability to preserve unimpaired that spirit of mutual regard between the two countries upon which depends to such a large extent the success of American policies in this part of the world, but the senate, prodded by Pacific coast interests, seems determined to carry out its idea of Asiatic exclusion without regard to the feelings of Japan. We can affront Japan at this time and salve our consciences that we are compelled to take drastic action in order to preserve our ideas of sovereignty embraced in the right to say who may or may not enter our country. We may be well within our right. There is no question about this. The real question will arise when we least expect it. Common courtesy to Japan at this time may find her on our side when the more vital issue has to be faced.

The Aftermath of Exclusion

EXCLUSION of Japanese from the United States will take effect from July first. Japan's pleas for a mere concession that in no way minimized the object of our new immigration laws have fallen on deaf ears in Washington. America with her great wealth, secure position and immense power has stood firmly on its sovereign rights to legislate against the further influx of Asiatics. To protect the economic life of California against the menace implied by the entrance of 250 more Japanese annually, the American government is willing to deprive thousands of skilled workmen in its Eastern and Middle Western factories of a livelihood they now enjoy from the sales of their products to Japan. Our best steel market outside of Canada is Japan. Our best machinery market is in Japan.

Blind to the real economics involved in the issue, America is making a present of its growing trade with Japan to European competitors.

Many important Japanese orders for American products have been cancelled in anticipation of the passage of the exclusion law. It is safe to predict that many similar cancellations will follow. European manufacturers have been keenly watching the situation prepared to take advantage of any revulsion of feeling towards the United States. The senate has played into their hands. Official Japan and her broader-minded financiers and merchants retain the hope that the affront will be mitigated by some new agreement that will maintain their national dignity. The great masses of Japan, however, accept exclusion from America as an accomplished fact.

Let us recapitulate. The doors of the West are closed to Asiatics. The millions of Japan must seek their future in Asia. American policies in the Philippines, in China and in Siberia, in addition to extra-territorial principles in China hamper Japan's struggles to find a peaceable solution to her problems. A ringed fence has been built up around Japan which in the end must keep her children at home. Here they must live and to live must work to earn the money to buy bread with.

Japan must have bread—or rice if you like—and she cannot produce it all at home. She must turn to China, to Manchuria, for her vital food supplies, but here America steps in with her ideas of equal opportunity that hampers the free development of the one part of China in which Japan's economic future is at stake. Japan, unlike the western nations, is not a meat eater. She does eat fish. It is her staple article of food. The Okhotsk Sea is to Japan what the great grazing grounds of the western states are to the people of America. Yet, it was only a few years ago that our secretary of state stood beside Russia in questioning the right of Japan to fish in these waters, a right conferred upon Japan by the provisions of the Portsmouth treaty.

The preservation of our rights to trade, the maintenance of our philanthropies in China and the future of the Soviet in Siberia are of greater importance to the United States than the mere matter of daily bread to the workers of Japan. How long do we think the Japanese will tolerate the application of idealistic diplomacy while their future existence is being slowly but surely undermined?

How long will it take for the Chinese and Japanese to come together? How long will it be before America's pocket is touched and it pays in dollars and cents for its policies towards Asia? For the present, perhaps, America can afford to disregard the essentials which make for economic prosperity through foreign trade. It can continue for many years to come to play the rôle of disinterested world philanthropist. Its wonderful prosperity and boundless wealth will for a long time stand the drain of millions devoted to uplift work in China. It can still continue to pay out two dollars in charity for every dollar earned in Chinese trade. It may be that philanthropy as our main business in China will pay handsomely in the long run; that future generations of grateful Celestials will recall the huge sums expended for the spiritual and social uplift of their ancestors and align them with us in any future world crisis. All this may come true. The Chinese have a great respect for their ancestors, but the present generation of American traders and manufacturers who are working against the greatest handicaps to establish their position in China, will not profit by it.

Let us look the situation calmly in the face. The news of the application of the Japanese exclusion act had hardly reached the Far East when the movement for a closer Sino-Japanese understanding was in full swing. China's national "Humiliation Day," a yearly reminder suggested by foreign advisers to keep alive the animosity engendered over the twenty-one demands, passed off without an incident worth noting. The Hankow chamber of commerce, formerly one of the most rabid anti-Japanese bodies, not only passed a resolution in opposition to any demonstration on humiliation day but came out openly against further anti-Japanese agitation. Chinese students in Tokyo called on the minister of foreign affairs to tell him that Asiatics must stand together. Many Chinese editors and high officials have voiced the same sentiments. The Chinese minister to Tokyo declares that the American exclusion act is directed against the peoples of a whole continent and is wholeheartedly in favor of Japan's extensive program for the development of cultural relations between the two countries. In fact, the first tendency is exactly as we have predicted. Chinese and Japanese have been driven together in a common cause to fight the insult and humiliation hurled at Asiatic people in general by America.

America has wilfully invited the consequences so mildly mentioned by Ambassador Hanihara and sensed at once by the intelligent mind of Secretary Hughes. We have done a service for Japan that otherwise would have been costly and difficult for her to do by herself. The remission of the Boxer indemnity balance immediately after the passage of the exclusion act will have no effect in retaining the good-will of China. Charity does not wipe out an affront.

The Japan Times sums up the situation in the following words:

"China seems to have begun to think exactly as Japan is thinking in regard to the unfortunate development in America. Congress is, it may be said, driving China to reconciliation with Japan, a turn of affairs, which no Japanese endeavors as such would have been able to bring about. That Japan and China should go hand in hand is in the order of things perfectly natural, but there have been Americans who would even give their lives to keep the two peoples ever increasingly in loggerheads.

We are not sorry that the supreme endeavors of these Americans are being doomed to failure through actions of their own congress. We hail, indeed, with boundless delight, indications that the right vein of thinking with respect to this country is becoming evident in China."

Up to Coolidge?

The Crucial Test of His Character

American Opinion Scores the Senate

AS was to be expected, the sober common sense of the American people has been outraged by the senate's precipitate and almost unanimous vote on the immigration bill. Perhaps never in our history has there been such a violent revulsion of feeling accompanied with such bitter and scathing criticisms hurled at the senate by the editors of the most important exponents of American public opinion. In effect, it is becoming increasingly evident that senatorial intervention in the conduct of our foreign relations which the constitution imposes on the president and the secretary of state is becoming more and more unpopular.

The New York World minces no words but calls the senate a mob. "The country," it says "will not look back with pride upon the senate's behavior, for it was animated by the lowest passion of a mere mob." The incident, it adds

"is merely the climax to five years of truculent aggression by the senate which has done immeasurable harm to the people of the United States. For in those five years the senate has not only paralyzed the executive; it has gone out of its way to offend foreign nations. The time has come for the American

people to see themselves as others see them, to understand their position in the world and to insist that their government act with that dignity and restraint which is the obligation of great power."

The most scathing rebuke comes from *The New York Sun* which enlarges on Japan's consistent course to gain the good will of America, her co-operation in making the Washington conference a success and her loyalty in carrying out its provisions with a promptness that put some European powers to shame. *The Sun* then sums up the situation in its true aspect when it draws attention to the fact that after stripping Japan of her advantages and weakening her power for defense we play the rôle of the bully and wantonly insult her. It says:

"It may not be fully realized how real were the sacrifices Japan made at the Washington conference. She was called upon to accept a 5-5-3 ratio in capital ships which seemed to her unfair; yet after protesting that it should be 5-5-3½ she gracefully yielded. Although Japan has a population that is pressing to the utmost upon her food and industrial resources, and needs room for territorial expansion, she consented to a series of far-reaching evacuations. She agreed to get out of Siberia and finished the removal of her troops in October, 1922. Simultaneously she gave up her hold on Shantung. The Anglo-Japanese treaty was abrogated. Does the senate wish to put America

in the position of stripping Japan of her defensive advantages, and then insulting her?"

The New York Times lives up to its reputation as one of the best informed newspapers on Pacific affairs by pointing out that the senate's rudeness and intemperance coming as the culmination of a long series of actions which the Japanese have considered as affronts to their dignity and racial pride, cannot but intensify the hatred of Americans by the Japanese. Thus one hour may undo the work of many years of diplomacy.

"Nothing more clearly shows how unwise it would be to yield to the senate that exclusive conduct of our foreign relations which some of its members arrogantly claim. Nothing better answers those senatorial critics who ignore the constitutional provisions giving the president the power to conduct negotiations with foreign nations. It was both a surprise and a humiliation to the country that not one of the senators was cool-headed or brave enough to call upon his colleagues to pause and consider the effect of their action. Not even the veteran senator from Massachusetts, a man long experienced in the vicissitudes of foreign affairs, had the courage to call the attention of the senate to the fact that Japan did not question the right of the American government to limit immigration as it sees fit. No one stopped to emphasize the passage in Mr. Hanihara's letter which expressed the willingness of the Japanese government to discuss modifications of the 'gentlemen's agreement.'"

"Instead, the senate cast responsibility to the winds and showed itself willing to sow the seeds of future wars in order to rebuke a fancied present threat. Such bull-in-the-china-shop tactics are as disconcerting to Americans as to foreigners. National susceptibilities cannot be petulantly trifled with. Fair play and common courtesy make it incumbent upon congress, in considering the final draft of the immigration measure, to reconsider the Japanese exclusion provision and to act, not with a desire to vent its august displeasure, but with a view to the national and international interests involved."

The New York Tribune says that the American people have no desire to insult Japan and it was childish on the part of the senate to slam the door in Japan's face because it detected a threat of some sort in two elastic words of a long communication.

"Of the sovereign power of the United States to regulate its own immigration laws there has been no question and there will be none. But the sovereignty of a great nation confident of its power surely does not need to be asserted with the gesture of a bully. In hunting afar for an insult and torturing language to find it the senators have acted like the legislators of a fourth-rate power. The sooner they return to American standards of dignity and self-respect the better."

The Wall Street Journal speaking for the great financial interests of the country reflects the thoughts of many serious-minded people who have followed the senate's activities ever since it was played upon by a group of Chinese propagandists to break the Versailles treaty through the Shantung decision. It has been said that Senator Lodge and a few of his colleagues have never forgiven Japan for getting out of Shantung. It would help to explain their present wholly inexplicable conduct. *The Wall Street Journal* declares that

"For a number of years past the United States senate has been declining, in prestige and public confidence. It might be possible, if the point were worth arguing, to date this deterioration from the popular election of senators, but the fact is beyond dispute. Less than twenty years ago, even ten years ago, there were forty members of the senate the equals or superiors of the best man there to-day, and incalculably superior in what may be called national spirit, unselfish appreciation of principle and contempt for petty politics."

"To-day the senate is laboring under what is super-scientifically called an inferiority complex. If it were really sure of its authority it would not be everlastingly parading it, in season and out. Its assertions of its powers and scope lack dignity."

"In such circumstances what more natural than that the senate should start a cheap quarrel with Japan in order to unite public opinion once more behind it, on the plea of patriotism? This has been the dangerous device of incompetent rulers since history began."

"This continual meddling in foreign affairs, with the assertion of powers in foreign relations which the constitution of the United States never gave, is not a proof of strength but of weakness. It can only happen in a body which has ceased to be sure of itself."

The New York Evening World says the same thing in another way:

"The childish petulance of the senate in repudiating the gentleman's agreement with Japan in a moment of flamboyant bellicosity is in keeping with its stupid performances in foreign affairs during the last five years. Senators are only interested in foreign affairs in so far as they furnish an opportunity for politics and demagoguery. The spectacle staged on Monday was for the benefit of the voters of California."

"But the senate, with the complacency of the brutal braggart of a bo who has killed a kitten or smashed a window, is pleased with itself. It has accentuated a problem. It has interfered with the amicable negotiations of the foreign offices in Washington and Tokio. It has given every demagogue and war-monger in Japan and the United States dangerous fireworks of the kind from which come conflagrations. It has treated an agreement entered into by the United States as a scrap of paper. And all this to prevent 240 Japanese from entering the country annually!"

"It is stupid—and it is characteristic."

The Philadelphia Bulletin says:

"The vital questions were those of diplomatic relations, and the result of yesterday's jingoism was to make harder the task of the president and the secretary of state in maintaining, not merely the peace of the Pacific, but the international friendship which underlies and underwrites that peace."

The New York Post harps on the same theme and says:

"Any sensible person realizes that Japan to-day is in no position to engage in a major war with such a power as the United States. It would be courting disaster and ruin. But the senators saw in the term a 'veiled threat' and made the most of it. They assumed their touchiest mood and climbed to the top rung of their dignity. They succeeded in making themselves appear extremely undignified, like small boys with chips on their shoulders."

"The United States is a giant in strength, and the world fully realizes it. It is about time we grew up mentally and morally to our physical stature. Instead, the senate makes itself ridiculous."

"Many persons resent the dictatorial attitude the senate has assumed toward President Coolidge and Secretary Hughes. The intelligent opinion of the country would support the president if he should see fit to veto the immigration bill, the terms of which would embroil him and the country in serious and stupid difficulties. The men we elect to regulate our foreign policy after all deserve some consideration."

The New York Tribune supplemented its first editorial quoted above, by adding:

"Whatever else the senate does with the immigration bill, it should strike out the obnoxious provision that humiliates Japan. It is a wretched exhibition of jingoism for senators in a mood of petulance to jeopardize the work of the Washington conference."

It follows this up by saying:

"Doubtless the United States is in a position to affront Japan or any other nation of smaller stature; but the bully does not cut a pleasing figure among men or nations."

The New York Times further condemning the senate's hasty action says:

"Hasty and intemperate legislative action merely serves to rekindle the deep fires of race hatred and to undo the work of a quarter of a century of diplomacy. Even if later repaired, the damage is incalculable. In this instance the blame cannot fairly be said to rest on Japan, which has consistently shown great forbearance in the presence of our American jingoes."

The New York Telegram regrets that

"The senate, as the custodian of foreign relations, refused to take the Japanese protest with the seriousness it deserved."

Many papers recognize that the senate did only what it should have done in the face of a threat on the part of another country, but ignore conditions existing in Japan which make such a conclusion ridiculous. *The Brooklyn Standard Union* seems to think that Ambassador Hanihara who holds his post because of his ability to say the right thing at the right time, "spilled the beans," by giving the senate something to hang on him. It, however, recognizes that the rest of the note qualifies the "veiled threat," and that being so "the senate will perhaps cool off and let gentlemanly agreements take the place of temperamental outbursts."

The New York World, however, brings up the real question that now takes precedence over all others in this controversy by speculating on whether or no President Coolidge will live up to his reputation for firmness of character and veto the bill, thus inviting the political opposition of the Pacific coast states to his nomination for the presidency in the coming convention. It says:

"The measure is unnecessary. It is brutal. It is dangerous. It does not cater to any real necessity of the Pacific coast and it does not represent the real will of the American people."

"If congress, in a fit of pique, insists on acting frivolously in a grave matter of this sort, the country will expect the president, by his veto, to save it from the consequences of this folly. It will look particularly to Mr. Hughes, whose fame as secretary of state rests upon his accomplishments for peace in the Pacific, not to allow all he has achieved to be destroyed."

At the height of the controversy, Secretary Hughes opened the republican political campaign in New York in a key-note speech, which, in effect, said that Coolidge, the man, is the party's platform. "The best assurance of the future is the character of Calvin Coolidge."

The New York World accepts the challenge and the following morning puts the whole immigration rumpus up to the president.

"If characters are to count in the coming campaign, the character of Mr. Coolidge is to be put to a severe practical test, as in passing the exclusion act congress has confronted the president with a choice between duty and expediency."

"Mr. Coolidge's duty is to stand by Secretary Hughes and veto the exclusion act."

"Mr. Coolidge's political interests call for acceptance of the exclusion act in order not to alienate the Pacific coast states."

"On the side of a veto are honor and loyalty to the best interests of the American people. On the side of approval is the tempter's argument that

Congress would override the veto, that nothing is therefore to be gained by it, and that valuable electoral votes would be lost by it. It is an argument which might appeal to some of the president's advisers. It is an argument to which a man of character would not yield.

"After Secretary Hughes's hearty and, we think, wholly sincere testimony, it cannot be assumed, without positive proof to the contrary, that Mr. Coolidge will fail to veto, or that he has abdicated all claim to leadership of his party."

We are inclined to take the viewpoint of *The New York World*

in that the crucial test of President Coolidge's character will arise when the exclusion bill comes before him for signature. We believe that duty rather than expediency will guide him at the last. If he listens to party politics and signs the bill in order to placate the Pacific coast, he undermines the one great constructive work of the Harding administration, the Washington conference, and the democrats will get him on this point. His only salvation is a strict adherence to duty. VETO THE BILL!

Altruism versus Horse Sense

What is America After in The Far East?

A Comparison of American and Japanese Colonial Policies

AN article by Mr. Ralston Hayden on Japan's New Policy in Korea and Formosa appearing in the last number of "Foreign Affairs" compels attention not only for the unbiassed manner in which he handles a difficult subject but for the comparison between altruism as exemplified by the application of American methods in the Philippines and the more practical colonial policies of Japan which have brought economic benefits and prosperity at the expense of social and political uplift.

Mr. Hayden's valuable contribution brings out forcibly the verdict that no matter which of the two policies are adopted and applied, the effect upon their beneficiaries remain the same. Law and order, economic prosperity, elevated standards of living and widespread education in Korea and Formosa have not wiped out the rising tide of political discontent evidenced in a desire for a larger share in their own government by the governed. A large part of the people in both colonies are still hoping and praying, intriguing and moving heaven and earth to achieve their independence. However, they are being pressed hard by the rising generation which sees things in a different light, and with continued prosperity, preservation of law and order and other guarantees of individual rights, as time goes on the new element will crowd out the old die-hards and assimilate with their rulers. They have a firm foundation of economic prosperity and now demand a larger participation in the administration of their own affairs. This, the Japanese government is trying to give them.

In the Philippines, after twenty-five years of altruistic rule catering to the purely social and political betterment of the native, elevating them to the level of their tutors at a sacrifice of their material well-being, we find instead of gratitude, an insistent demand for immediate independence. American methods in the Philippines have simply created another South American state, in which with all avenues for industrial development closed, the graduates of the many schools and colleges have taken to politics as a duck does to water. Educated far beyond the requirements of the industrial life of the country and with no place to put into practice the learning acquired, it is natural for these high-collar graduates to seek government jobs. Had they been provided with an opportunity to work through the development of insular resources hand in hand with cultural progress, the Philippines to-day would have been in a better position to embark on an independent adventure.

For the present at least the Japanese program, despite its initial mistakes and harshness, has brought economic prosperity and physical contentment to the people of Formosa and Korea, a good ground for further uplift work. They can now stand on their own bottom without help from the Metropolis. They have established a solid foundation on which to erect a political superstructure that will endure. In the Philippines these conditions are reversed. An economic foundation that will bear the weight of political independence is lacking. American concern for the future of their wards and an overzealous desire to protect them from spoliation has prevented the free influx of capital and labor to develop their resources. What prosperity they enjoy is derived from the re-

mission of American duties on sugar and tobacco, a free gift from the American treasury. Take away this favored tariff position by conceding independence and there remains no foundation on which to erect a lasting political edifice. To maintain their independence and provide the funds to keep their heads above water as a going concern, the doors of an independent Filipino republic will have to be opened to Chinese and Japanese labor and capital. They will have to start at the bottom of the economic ladder and even under the most favorable conditions, it will take them another two or three decades to arrive where Formosa is to-day.

With a population of 3,500,000, the annual income of the Formosan government is about \$50,000,000 gold while the Philippine government exercising jurisdiction over 11,500,000 people, ekes out an existence with revenues totalling about \$32,000,000. With the vastly superior natural resources of the islands and working under a program similar to Japan's in Formosa the insular revenues should now be \$150,000,000, or even more. As a purely commercial and economic proposition the Japanese program has benefitted Formosa five times as much as the application of American ideals in the Philippines.

Politically, the Filipinos have been educated until they can stand alone. The sweeping demands for independence now voiced by all factions and parties is an indication that the *politicos* are seeking some way in which they can create an economic prosperity and provide occupations for the educated classes. The laws as they now stand maintain the islands closed to capital, closed to labor and closed, therefore, to economic development. We have fed them cake when they cried for bread. They are surfeited with sweets and want something more substantial. They seek this through complete independence, starting their new life well equipped in mind and morals but like most college graduates, without a cent of capital other than their brains. They will probably go farther in the long run, but they will have to work harder.

We are inclined to favor the Japanese idea of colonization borrowed from Europe. To our mind, there is little gained by highly educating a backward people and then withholding the opportunities to put their knowledge into practice. It would seem much more sensible to improve their economic conditions and provide an outlet for their activities before elevating their social and political status. People enjoying economic prosperity are less prone to enter politics as a career, seeking their future in business rather than in government employment. Economic prosperity brings a desire for general education and develops in time that high type of citizen who takes an enlightened interest in government for the betterment of the public welfare.

Any country lacking a firm economic and industrial basis will breed politicians, job-hunters, grafters and other parasites who live at the expense of the people. This is what we have done to the Philippines.

We have carried our altruism into China, educating thousands of young Chinese in our colleges, turning them adrift with diplomas and degrees to return to a country where there is little opportunity to capitalize their knowledge. In effect, at least ninety per cent. of these returned students have either turned political agitators or

drifted into government jobs, where as the years roll on, experience tells us they become more hard-boiled in their outlook on public questions than any of the old type mandarins they displaced. We have expended millions to uplift the Chinese and better his moral, social and intellectual status: we have turned out hundreds of young Chinese engineers from our colleges, but not one cent have we contributed towards the material development of the country so our proteges can apply what they have been taught. In the same way that we have transformed a race of contented farmers in the Philippines into vociferous *politicos* shrieking for freedom, so we are storing up trouble in China by creating highly educated professional men whose only opportunity to apply their new learning, lies in political agitation or the holding of a soft government job. In the same way that it will bring no material gains to our commerce in the Philippines, so our policies here in China will bear little fruit in the keen trade competition with less philanthropic nations. The Chinese will buy in the cheapest market and where they can get the best terms.

A reaction to the exalted missionary fervor to spread American ideals throughout the world by encouraging backward peoples to shout for democracy, self-determination and national rights has set in. Sensible Americans are awakening to the truth that they alone cannot regenerate the world, and are concentrating their energies towards making their own country safe for democracy by combating the disintegrating influences which a misguided immigration policy has brought on our heads. American foreign policy is changing. The sway of the altruist, the dreamer and philanthropist which reached its climax under President Wilson, is giving place to a more practical outlook on world affairs.

Only a few years ago there existed a large element in America who fervently believed that it was the duty of the United States to "lick the daylight out of Japan" in order to protect 400,000,000 Chinese who would not fight for themselves. There are other Americans equally emphatic in urging the United States to free the Philippines and protect them against all future enemies and without any compensating advantages to their own country. This typifies the missionary spirit of America gone mad. It is refreshing to learn that one democratic senator has had the courage to voice common sense ideas in the following reply to Secretary Weeks, who asserted that America's duty to the islands had not been fulfilled, that the time had not arrived to sever relations:—

"For twenty-five years we have gone on giving what seemed to us many benefits to the Filipinos. Here is this group of gentlemen [the independence mission] who represent the more educated of them. They have seen their country develop with roads and schools; they have seen disease reduced and mortality cut in half. They are the most educated of their people, and although they have seen all those things, they want us to get out and get out quickly. Why should we go ahead giving an unwanted generosity to them? Why should we force our benefits down their throats, and why should we adjust our military policy as we do and pay out money for the defense of the Philippines as we do? Why should we spend \$12,000,000 a year for the protection of a group of people who do not want our protection? Is it not time for us to be selfish?"

To which Secretary Weeks replied: "If you are going to proceed from our own standpoint as a nation, for any benefit we get out of it, I would say get out of the Philippines, because we do not want to make anything out of the Philippine islands."

Secretary Weeks evidently still holds to the old idea of America's mission in the world. "We do not want to make anything out of the Philippine Islands." But we are willing to squander millions taken from the pocket of the tax-payer for the uplift and protection of our wards for the pure joy of altruism, with no thought of possible trade returns or of preparing the Filipinos to take over the task of defending themselves. It stands to reason that somebody, sometime, is going to make something out of the Philippines, reaping where we have sowed. If we are to preserve intact the present laws which militate against the investment of foreign capital on a large scale and apply our Asiatic exclusion laws in an Asiatic country, the islands will never be developed and never reach that point where they can stand alone. In other words, under these conditions the time will never arrive when America can sever relations with the islands. Such a program is immoral, an insult to the intelligence of the American people and a millstone around the neck of the Filipinos.

The same spirit is demonstrated in our policy towards China, with the difference that here we do hope in time to make something, at least maintain equal opportunities with other nations to make that problematical something. Yea, we are willing to fight at the drop of the hat to preserve our footing in China and appropriate hundreds of millions for huge navies in the Pacific to assure that our

rights in this direction are not impaired. Yet an analysis of the China trade situation will conclusively prove that our philanthropists subscribe for uplift work in this country twice as much as our traders take out in profits. We will not invest one dollar in China to expand our trade possibilities, yet we make huge appropriations to protect our interests here, which on further analysis says, we are interested solely in our right to continue to function as an eleemosynary institution.

If Secretary Weeks is right in saying that "we do not expect to make anything out of the Philippines" and we are right in our analysis that we do not expect to make anything out of China further than the right to pose as philanthropists, giving away millions of the tax-payers' money that is sorely needed to meet national expenses at home, then what in the name of all that is holy are we doing in the Far East? We certainly do not require a huge Pacific fleet, Yangtze patrols, naval bases and other extravagant military equipment to continue in business as an eleemosynary institution. We can win our halo without the aid of such expensive persuaders. If our main mission is philanthropic, we may as well scrap the Pacific fleet and save the nation millions for upkeep that now flows out through other channels for uplift. Let down the bars in the Philippines so that capital and labor can create that firm economic foundation upon which a stable and efficient government can operate. Give the Filipinos bread to eat instead of pap and let them work out their own destiny. Work out a balance sheet of our trade with China and include those invisible exports of missionary and philanthropic gold added to the millions sent home each year by the Chinese residing in America and find out just where we stand. If we insist upon remaining in the philanthropic business, let us back up our uplift campaign with the millions that will create an economic basis in China so that our missionary endeavors will bring material returns in the future.

Americans have milled around in the Far East for the past two decades talking loudly about equal opportunity, the "open door" and the immense trade that awaits our manufacturers in China, while each year the capital investment in missionary, educational and uplift institutions keeps rolling up by its own momentum, yet not one dollar rolls its way into developments that will make possible the realization of our trade dreams and justify the enormous expenditures on armaments. It is time to be practical.

G. B. R.

Merit Rewarded

As a reward for his efficiency as acting manager of the Manila Railroad Company, Director of Public Works Jose Paez has been appointed general manager of the railroad. Director Paez took over the affairs of the railroad after the death of Colonel H. B. McCoy some months ago, at which time it was expected that a prominent railway executive would be called from the United States to take the vacant position. This was soon found to be unnecessary owing to the ability displayed by Mr. Paez in discharging his new duties, and his temporary position has now been made permanent.

* * *

The United States will have an embassy building worthy the name if plans forwarded to Washington by Ambassador Cyrus E. Woods are approved and the money made available by Congress. It is estimated that building and grounds will require an outlay of \$1,000,000 and as additional land has been offered the Embassy in the shape of a lease of the estate of the late Prince Ito which adjoins the former embassy site, the grounds can be made commensurate with the building. Ambassador Woods took the matter up with the State Department and the proper committees in Congress on his recent trip home and was assured that action would be taken during the present session of Congress.

* * *

According to Manila advices, the Philippine government is planning to dispose of its interest in the Cebu Portland Cement Company to a group of capitalists represented by Mr. C. F. Massey, president and general manager of the company. The price to be paid is said to be Pesos 2,600,000. It is understood that the sanction of the Board of Control, composed of Governor General Wood and the heads of the Senate and Assembly, has been given.

Japan's New Policy in Korea and Formosa

By Ralston Hayden in "Foreign Affairs"

BARON MAKOTO SAITO, governor-general of Korea, stated the fundamental principles of the colonial policy of the Japanese empire in three terse sentences: "The economic development of the country must come first. Education and the raising of the standards of the people will follow. Afterwards political development may be possible." He was discussing the problems of Korea, but his words describe perfectly the course which his country is following in every colony over which floats the banner of the rising sun. Prior to 1919 this policy was carried out by the application of naked

harbor works and port facilities, visits substantial and handsome public buildings that are far superior to those of most American states, and rides over a well built, excellently equipped and efficiently operated railroad system. He travels through two hundred miles of agricultural land that is as intensively cultivated as that of Belgium, and inspects enormous and growing industrial plants. Wherever he goes he observes all of the external evidences of prosperity.

If he turns to history and statistics the investigator discovers that this prosperity is genuine and that without question it is a



Baron M. Saito, Governor General of Chosen.



Baron K. Den, Governor, General of Taiwan.

JAPAN'S LIBERAL PRO-CONSULS WHO BROUGHT REFORMS TO CHOSEN AND TAIWAN

force. In that year, however, the velvet glove of conciliation and "attraction" was slipped over the iron hand of Japanese control in Formosa and Korea, Japan's greatest colonies. The new methods by which these dependencies have since been ruled are being closely watched by the governments having large interests in the Far East. The United States in particular is interested in this newest phase of Japanese colonial policy not only because it has an important bearing on the general question of peace in the Orient, but because it offers some striking contrasts with the policy which America has followed in the Philippine Islands.

Japan acquired her first large colony, Formosa, in 1895 at the end of her victorious war with China. The population consists of about 3,500,000 Chinese, 80,000 Malay aborigines and 160,000 Japanese.

The traveler in Formosa is soon impressed with the truth of Baron Saito's statement that under the Japanese system the economic development of the country comes first. He sees splendid

result of Japanese rule. When the Japanese took over Formosa its annual imports and exports amounted to just a little more than 20 million yen; in 1921 they were worth more than 286 million. Until 1905 Japan annually subsidized the government of Formosa to the extent of millions of yen; for the past eighteen years the colony has made annual contributions to the imperial treasury. The Japanese have introduced scientific methods and abundant capital into industry, agriculture, fishing, mining, and forestry. They have created a modern transportation system. Above all, they have established a rule of law maintained by a reasonably honest and efficient government. Given these advantages, which it never had under the Chinese empire and apparently could not yet expect as a province of the republic, the Chinese population of Formosa has done the rest.

The remarkable economic development of their country under Japanese auspices has not, however, escaped the bitter criticism of the Formosan Chinese. Japan's policy, they believe, is simply

that of vicious exploitation. In the early days of the occupation they were robbed of the richest lands in the island by terror and chicanery. The Japanese government has monopolized the production and sale of camphor, tobacco, salt, opium, saké, and other spirits, the most profitable Formosan industries. The Formosans claim that their resources and labor are exploited by Japanese capitalists, and that the tariff laws give Japan a monopoly of the market and compel them to pay monopoly prices. In a word, it is their belief that the Japanese and a few rich Formosans whose political support they have purchased are the only ones who profit by the development of the country.

Investigation on the ground leads to the conviction that there is much truth in this indictment. On the other hand, there is no doubt that the lot of the common man is immeasurably better in Formosa now than it was before the Japanese occupation, or than it is in China. As for the higher class Formosans, they are beginning to participate more generally in Japanese enterprises in the island, and doubtless will obtain a larger share of the profits.

The visitor in Formosa also discovers the truth of Baron Saito's dictum that education and the raising of the standards of the people will follow economic development. He finds that Formosan cities are among the cleanest in the Orient, that they are well equipped to perform all of the manifold services expected of modern municipalities, and that they are efficiently managed. The same praise might well be given to the educational system and to the departments of sanitation and public health. In 1895 Formosa was justly considered to be one of the most unhealthy countries in the world. To-day no part of the Orient has more favorable health conditions, while a comparison of the Formosan health and medical services with those of the Philippines, for instance, is distinctly to the disadvantage of the latter.

"Afterwards political development may be possible," said Baron Saito. Is it possible in Formosa while that island remains a part of the empire of Japan? The Japanese say that they hope so and that the colony is now entering this third and most delicate phase of its development. The Formosans are skeptical and point to the record of the past to justify their lack of faith in the future.

For seven years after 1895 the Japanese army practically ruled Formosa. During this period the organized resistance of the Chinese population against their new sovereign was broken, banditry was stamped out, and the savage aborigines were brought under control. At the end of 1902, for the first time in its long history, law and order prevailed in the "Beautiful Isle." Life and property had become as safe there as in Japan. The reign of the soldier was followed by the rule of the policeman. When Viscount Kodama became governor-general in 1902 he gradually limited army activity to military affairs and exerted his authority over the people chiefly through the medium of a Japanese police force. Japanese as well as Chinese residents in Formosa declare that the policeman was a harsher and less considerate master than the soldier. Frequently he was of a distinctly lower type than the police in Japan proper. He held his Chinese wards in contempt, often spoke their language haltingly or not at all, and was apt to regard his short, blunt sword as the means best fitted for explaining and enforcing government ordinances. These ordinances regulated every aspect of life in Formosa. They

were, and are, extremely galling to the Chinese population, for the Chinese are individualists who put personal liberty among the first of the desiderata of life.

Prior to 1920 scarcely a trace of self-government could be found in this oldest Japanese colony. The governmental organization was, and is, simple. At the head of the bureaucratic hierarchy stand the governor-general and the director-general of civil administration. They administer the government through the bureaus of the government-general, the governors of the seven provinces, and the chiefs of the fifty districts into which the island is divided. All of these officials are members of the Japanese civil service, an organization which exhibits the usual virtues and defects of highly trained bureaucracies. This hierarchy is paralleled by a series of police officers, directed by a bureau of police in the central government. Within the towns and villages the people are divided into small groups, for each of which a native headman is made responsible.

In 1919 the imperial cabinet took the initial steps towards the liberalization of this autocratic system of government. Baron Kenjiro Den, a distinguished liberal statesman, became the first civilian governor-general of Formosa, and a series of important reforms was undertaken. With the chief executive officer of each of the political divisions of the island was associated an advisory council. These councils are appointed and are composed of Japanese officials, private Japanese residents of Formosa and Formosan Chinese. Their functions are advisory only and obviously they are completely under the control of the government. Nevertheless they do afford an official channel for the expression of popular opinion; they may be able to influence, even though they cannot possibly control, official action. In Formosa great differences of opinion exist as to their value. There seems to be a general feeling, however, that the local councils are giving the people some voice in the administration of local affairs.

Coincidentally with this extension of political privileges the government adopted the policy of offering to Chinese Formosans educational opportunities equal to those afforded Japanese residents. From their first days on the island the Japanese had furnished primary schools for Chinese as well as for Japanese children. Instruction, however, was in the Chinese language, the schools often were inferior in quality, and it was only in exceptional cases that Chinese children actually passed into the higher institutions, in which Japanese alone was spoken. "This is manifestly unjust," said Baron Den. "It is eminently proper that we also grant them opportunities of education not inferior to those available to our own children; that we encourage them to develop; that we foster men of genius in all walks of life, thereby increasing the resources of our country. And it is with this in view that I have made it possible for Formosans qualified in the Japanese language to enter schools for Japanese children. Excellent results have already been obtained, with incalculably good effect upon our policy of assimilation." (The italics are the writer's.) As a further measure of assimilation with Japan the imperial civil and commercial codes have recently been extended to Formosa.

Although the displacement of the old Chinese law may cause some temporary confusion and hardship, yet it will give Chinese Formosans many rights which they have not hitherto possessed, and will put them on a legal equality with the resident Japanese.



His Excellency K. Uchida, the Newly Appointed Governor General of Taiwan, who Succeeds Baron Den.



One Result of Japan's New Policy in Korea. The Korean Prince Riozeishi, Captain in the Japanese Army at the head of his Company.

The professed goal of the recent reforms in the administration of the island is the "Formosanization" of the government and, perhaps, its ultimate assimilation with that of Japan. The writer believes that this is the real purpose of the Japanese. Whether they will have the political sagacity and the courage to accomplish it, —whether, indeed, it is possible of accomplishment,—is another matter. Twenty-seven years of despotism is not a very sure foundation upon which to build liberal institutions. A large number, probably a majority, of the politically active Formosans will not even admit the sincerity of the government's intentions. A mass meeting of Formosans residing in Tokyo recently adopted and distributed resolutions criticising Baron Den's administration bitterly. A paragraph from this manifesto, translated into English by a Japanese, sets forth some of the political grievances of the nationalists and reveals their general attitude towards the "sham reforms":

"According to the present system of government in Taiwan, the powers of making laws, judicial and other acts of administration are vested in the governor-general. It is really a despotic government. The governor-general does not understand the real will of the Formosans, who have special life and customs. He does nothing but hoodwink the people by establishing false self-government, by allowing Formosans into Japanese schools,—not actually carried out,—and by promulgating dead laws allowing Formosans to become higher officials. As an instance of maladministration we point out the rigorous laws governing the punishment of rioters, unlawful disposition of loafers, compulsory labor, intervention in sugar cultivation and its sale, requisitioning of money and land, etc. Thus the government infringes upon the rights of the people and they are able to do anything they want. The almighty government! . . . The lawful organization of the political society claiming legislature in Taiwan was prohibited, to the great disappointment of Formosans who rely upon the Japanese empire. The magazine *Taiwan* was prohibited distribution, as it contained articles by noted men of Japan on the claim of Formosa for a separate legislature. 3,600,000 Formosans have no recourse for redress, enduring oppression and humiliation. Such an attitude of the government only tends to provoke the ill-feeling of the ruled, and is not the one to be taken by wise administrators who wish ultimate success in the administration of the island."

This manifesto could not have been issued in Formosa. The expression of public opinion there is made practically impossible by the government. But Formosans in Japan, Manila, and the China coast cities tell whom they can that their people will never cease to resist assimilation, and that China will not rest satisfied until the Japanese are expelled from this old Chinese province. Occasional flashes in Formosa itself reveal the forces of discontent that are normally concealed by the Japanese machinery of repression. A number of strikes of a revolutionary nature have occurred in the upper schools; upon the occasion of the visit of the prince regent last April 532 prisoners who were in jail for revolutionary activities were given commutation in their terms of imprisonment. A highly intelligent Japanese gentleman told the writer in Formosa that, "It is now a race between liberalization and revolution."

More than a quarter of a century of despotic Japanese rule in Formosa, then, has produced the following results: law and order, economic prosperity, elevated standards of living, widespread education, and rising political discontent. The writer believes the Japanese government realizes that if it cannot solve the political problem with which it is now faced, its remarkable material achievements in Formosa will, in the end, avail the empire nothing.

In Korea the Japanese have applied the general policy and many of the methods which they first developed in Formosa. The economic results bid fair to be equally satisfactory, although the problem is both greater and more complex. No one who has not seen with his own eyes what the Japanese have done in Korea can appreciate their truly remarkable accomplishments. Railroads, steamship lines, hotels, banks, mines, afforested mountain sides, scientific agricultural projects, schools, hospitals, and cities of stone, brick and cement are the visible products of the marvelous mechanism of colonization which Japan has built up during the past generation. No country has ever created such a complete, well organized, abundantly capitalized and ably directed organization for the economic penetration and conquest of other lands.

Thus far the masses of the Korean population have appreciated the ministrations of their foreign rulers about as heartily as our early activities in the West were relished by the Crees and the Sioux. Yet they are on the ground, 17,500,000 of them. They

possess a national history, national institutions, and a national consciousness that are more ancient than those of Japan herself. If they are lazy and decadent they are also proud and stubborn. Unlike the American redskins they cannot be brushed aside, driven out, nor exterminated.

The Korean rebellion of 1919 revealed to the world that Japan's astonishing material achievements in this colony had been accompanied by a tragic failure to solve satisfactorily the problem of the government of the Korean people. Nor was the lesson lost upon the Japanese themselves. No sooner had the rebellion been crushed than vigorous steps were taken to reorganize the government of Korea and to infuse a new spirit into its administration. An imperial rescript announced that the objects of the reforms were "to treat both Japanese and Koreans as equals, and to enable the people of Chosen to live in peace and prosperity by endowing them with an administration conducted on a liberal and cultural line." The new governor-general issued a proclamation frankly admitting the necessity of reforms and outlining the policy which he expected to follow. "I am determined," he declared, "to superintend officials under my control and encourage them to put forth greater efforts to act in a fairer and juster way, and promote the facilities of the people and the unhindered attainment of the people's desires by dispensing with all formality. Full consideration will be given to the appointment of Koreans so as to secure the right men for the right places, and what in Korean customs and old institutions is worthy of adoption will be adopted as a means of government. I also hope to introduce reforms in the different branches of administrative activity, and enforce local self-government at the proper opportunity and thereby insure stability for the people and enhance their general well-being. Sedition, however, was not to be winked at, and the proclamation ended with this sentence: "If anybody is found guilty of unwarrantably refractory language or action, of misleading the popular mind, or of impeding the maintenance of public peace, he will be met with relentless justice." In effect, the Japanese announced a new deal in Korea; but served notice that they would still make and enforce the rules of the game.

A large volume would be required to describe all the reforms which have been inaugurated in Korea since 1919. A few of the more important ones may be mentioned, however, with the remark that they constitute an official confession of the previous existence of conditions in Korea against which even the most docile of people might have been expected to revolt.

1. The government has abolished legal discrimination between Koreans and Japanese in the Korean civil service with reference to salaries, pensions and promotions, court rank, and decorations. The regulations limiting the jurisdiction of Korean judicial officials to cases in which both parties were Koreans have been rescinded. Punishment by flogging, which had been applicable only to Koreans, has been abolished. A general amnesty has been granted to Koreans implicated in the rebellion of 1919.

2. Formalism and red tape in the conduct of the government have been greatly reduced. Civil officials, save in exceptional cases, no longer wear uniforms. There has been a considerable decentralization all through the government, especially as between the central and the local administrations.

3. Means have been provided for the expression of Korean opinion. Leading men from all of the provinces are called to Seoul periodically for an exchange of views regarding the administration of the country. Inspectors, both Korean and Japanese, are continually in the field, "for the inspection of local conditions as well as for the observation of popular ideas and desires." The publication of a few newspapers printed in Korean is permitted. The central council, long intended to serve the governor-general as an advisory organ, has been reorganized and is more frequently consulted.

4. The educational system has been reorganized in such a way as to meet, in part, the wishes of the Koreans.

5. The local administrative system has been reorganized. Partially elective, partially appointive advisory councils have been created in the several areas of local government. A portion of the Confucian temple funds which had been diverted to other purposes (stolen, the Koreans aver) has been returned to its former uses. The requisition of labor and the forced donation of land for the construction of highways has been greatly reduced.

6. The police system has been reorganized. Prior to 1919 the police and the gendarmerie were united under one command and were directed from the central government. The two services have been separated, the former has been reduced in size, and

the direction of the latter transferred from the central to the provincial governments.

7. Definite steps have been taken to guarantee an increased respect for Korean usages and customs.

In addition to instituting these specific reforms the Japanese have attempted to win the confidence and the co-operation of their Korean subjects by many other means. Influential Koreans are taken to Japan and there entertained with the charming hospitality of which the Japanese are masters. A moving picture film service has been used extensively to familiarize Koreans with Japanese life, and vice versa. A special propaganda office has been established to acquaint the people of Korea, Japan and elsewhere with the new governmental policy. Representative Korean officials, teachers and scientific men are frequently sent to Japan to attend conferences of leaders in their special fields. Social intercourse between the two races is encouraged at every opportunity. Vigorous efforts are being made to educate the rising generation in the Japanese language. No opportunity to emphasize the racial and cultural affinity of the Koreans and the Japanese is overlooked, and their common citizenship in the empire is constantly harped upon.

Obviously it is difficult for an outsider to gauge either the sincerity or the probable results of such a reform program. Indeed, even the opinions of Koreans and of Japanese and foreigners long resident in Korea differ on these questions. The writer felt at the time, and still feels, that the governor-general, Baron Saito, spoke very frankly about the purposes of his government and the difficulties with which he is confronted. After declaring that economic development *must* come first, that education and elevated standards of living *would* follow, and that afterwards political development *might* be possible, he went on to say that there were many difficulties to be overcome. "The chief of these arise from the character of the Koreans. Many of them are crooked. They want 'squeeze' from the Japanese and their own people. They are lazy. At present Bolshevik agents and money are stirring them up. The Russians, though, are clever. They do not give them too much money at once. Of course there are many Koreans who wish to co-operate with us for their country's welfare. But we cannot ask too much of these men. They are in danger from their own people. The Japanese desire to have the Koreans contented and happy. We don't want to make Japanese out of them against their will. But for our own safety, we must govern this country. We hope that in time the Koreans will realize that they need our assistance. They can do nothing by themselves." These plain words from the man who is the chief instrument of Japanese rule in Korea are refreshingly at variance with the familiar propaganda about peace, harmony and brotherhood in a land where these blessings have not existed for many years.

Like Rome at its best, Japan sends first-rate statesmen to be her proconsuls, gives them free rein while in their provinces, and holds them to account for results. No colonial minister or department in Tokyo stands between the Japanese governor and the imperial cabinet. The colonial bureau is merely a secretariat attached directly to the office of the premier. Its chief is not an important or powerful official, and its functions are merely the transmittal and filing of colonial papers. Japan's colonial governors are immediately responsible to the premier alone.

Among foreigners resident in Korea there is much more respect for the present administration than a visitor at first supposes. For the brutalities and stupidities of the past there is little but reprobation. But those Europeans who themselves have to deal with Koreans seem inclined to talk about the difficulties with which the government is faced as well as about its shortcomings. One foreigner whose opinion regarding Korea would be respected anywhere spoke substantially as follows: "One of the greatest difficulties faced by the Japanese is in securing the co-operation of the Koreans. Of course a large proportion of the population is determined never to co-operate. But there is, and always has been, an important Japanese party among the Korean people. This party is growing rapidly. Its members have made up their minds to accept Japanese rule as inevitable and to make the most of whatever advantages are offered by it. Yet they seem to be unable to get together among themselves or with the government on any practical proposition. The masses are indifferent, or at least quiescent. The 'intellectuals,' who have not much to lose, are the principal agitators. The trouble with them is that they do not tie up to any principle. They reach for and seize this panacea and that. Their minds are

in a ferment but produce nothing. They don't know what they want, but they want it like the devil."

This same foreigner had recently returned from a trip which had taken him into every corner of the peninsula. "I found," he said, "that the Japanese are just as active in public health enterprises, educational work and other activities in remote districts as they are along the trunk line railway. I visited schools everywhere and found them crowded to capacity. Out of 300 or 400 pupils only twenty or thirty would be Japanese children. The rest were Koreans. The teachers were both Korean and Japanese. A few years ago—before 1919—the people were indifferent or hostile to the schools. Now they are eager to have their children attend, and the problem is to take care of them all. In recent years the knife has been used pretty freely on the Korean budget (made in Japan), but the school appropriations have not been touched. In fact, last year when there was a million and a half yen cut in the personnel of the government that amount was added to the educational budget."

Many other resident foreigners relate incidents in their experience with the Koreans and express opinions concerning these people that tally closely with those of the gentleman just quoted. One of the most distinguished of them in discussing the attitude of the Koreans toward the Japanese said: "In 1919 the country was aflame with hatred of the Japanese, a hatred that can be well understood. Many of the causes of that bitterness have been removed. The older people still cherish it fiercely; many Koreans try to keep it alive as a matter of pride, or of habit, or almost of religion. Yet time is working against them. Education and modern civilization are working against them. Thousands of Koreans who as a matter of course tell you that they hate the Japanese, get along perfectly well with the individual Japanese people with whom they come into daily contact. I should not care to predict how it will end, but we all know that if the Japanese were to withdraw to-day there would be chaos to-morrow."

For obvious reasons it is much easier to get the story of the Korean nationalists in many other parts of the Orient than in Korea. In Manchuria and Siberia reside more than 2,000,000 emigrants from the former Hermit Kingdom. Small groups of them are to be found in many of the cities along the China coast and in Japan itself. The Japanese propaganda agents very naively say that the Manchurian-Siberian group, most of whom are agriculturalists, emigrated "on account of the difficulty of living caused by the extraordinary rise in the prices of commodities in recent days; as a matter of fact, some 45,000 Koreans migrated from Chosen to Manchuria during 1919, mostly from this cause." (The italics are the writer's.) The plain fact is that most of these people abandoned their homes and fled from their native country rather than endure Japanese rule; or, in many cases, because the Japanese robbed them of the land upon which they had lived. A majority of the leaders of the Korean party of violence are members of this group. They hope to overthrow the Japanese régime by assassination, rebellion and attacks over the northern border, and they make frequent attempts to oust their foes by these means.

One centre of Korean nationalism is in Shanghai. The "Provisional Government of the Republic of Korea," which was set up there in 1919, and which sent emissaries to the peace conference at Versailles, has now disintegrated. It has been replaced, however, by a "Korean Congress" composed of about 150 members representing the irreconcilables of Korea, Manchuria, and Siberia, as well as exiles living in Hawaii and the United States. One of these irreconcilables gave the writer an account of the character and the activities of the "Congress" which tended to confirm much already learnt in Korea itself. "We have been sitting now for several months," he said. "There are two main parties. One of them wishes to use violence of every sort against the Japanese. The other, representing the American Koreans and other groups outside of Manchuria and Siberia, feel that we cannot cope with Japan's military power and must rely upon moderate methods and a constant appeal to world opinion. So far no agreement has been reached by these two factions. Feeling between them has been bitter at times. Our difficulties are increased by the constant presence of spies. Whatever we say, the Japanese know all about it the next day. If a dozen of us meet secretly each one wonders who is the traitor. Of course we have our organization in Korea. But Japan still rules there by terror and our men are constantly being taken. Only to-day I learned that one of our friends who had been collecting

data upon the extent to which the Koreans have been dispossessed of their lands, was arrested as he was attempting to get out of the country. But we have ways of keeping in couch with our people at home. If one man is caught another gets through."

This Korean is confident that the new Japanese policy of "attraction" will fail to win his people just as the former application of undisguised force failed to subdue them. "We have no fear for the long future," he said. "The Korean people will never give in. The Czechs held out for several centuries. Now they are free. We can do that, and more. The Japanese are always doing stupid things to keep the hatred of our people alive. They will have to take all of our land and drive us all out of the country before Korea will be safe for them. This they cannot do."

The more intelligent of the Korean irreconcilables pin their hopes for the future upon China and Russia. They regard Japanese supremacy in the Orient as a passing phase, a mere incident in the great drama of history. In common with many Chinese they hold their overlords in contempt as well as hatred. Inevitably China will come into her own. When she does the barbarians will be broke utterly. This is what one hears from Mukden at Batavia. As for Russia, her day is coming too, they say. She does not forget.

An American who returns to the Philippines after a sojourn in either Formosa or Korea would be less than human if he did not feel a certain sense of pride in the larger spirit of liberty which is characteristic of our Oriental dependency. Yet those who understand the situation in the Philippines recognize that in one important phase of colonial development the United States has been far less successful than has Japan; and they realize that both Americans and Filipinos, especially the latter, will have to pay the price of that comparative failure.

During the American régime in the Philippines political and general education has enjoyed an unparalleled growth. Yet during this period Americans and Filipinos have not succeeded in laying an economic foundation substantial enough to support the social and political superstructure which they have erected. The result is that not only independence but further progress of any sort in the islands must wait upon the creation of a vastly greater national income than will be available for some years to come. The Japanese, on the other hand, have proceeded much more slowly in the social and especially the political development of Formosa and Korea. Once they are seriously embarked upon a progressive program, however, both of these countries will have at their disposal ample means for the completion of their task. At the present time the annual income of the government of Formosa (population 3,500,000) is about \$50,000,000; while the government of the Philippines (population 11,500,000) has at its disposal about \$32,000,000 yearly. Considering the cost of the modern civilization which both of these people covet these figures are of great significance.

Where are the Japanese coming out with Korea and Formosa? Will their present policy of "attraction" and the great material advantages which they have given these colonies so dim the memories of the past as to produce at least an acquiescence in Japanese rule? Or, in some future struggle, will one of these dependencies prove to be the Achilles heel of the island empire? Press reports of a bloody uprising of Koreans in Tokyo and Yokohama during the recent disaster suggest vividly the dangerous possibilities of a permanently hostile population in Formosa and Korea. In the developments of the past four years there is much evidence that Japan realizes the danger of the situation and that she is determined to consolidate her military gains by political and moral victories. It is to this end that the new Japanese policy in Formosa and Korea is directed.

1924 Plans for Machinery Exports

Extracts from a Recent Report by W. H. Rastall, Chief Industrial Machinery Division, U. S. Department of Commerce
The Sales Manager's Problem

IN developing plans for their sales campaigns of 1924 machinery manufacturers of the United States may find it necessary to completely revise their estimates of the relative value of various foreign markets. Frequently in conversation manufacturers indicate that they feel that their entire export interest lies in Europe, although statistics show that about 80 per cent. of the machinery exported from the United States now goes to non-European countries. It should also be emphasized that during the last decade these non-European markets have become much more important to the American machinery-export trade. Furthermore, since the armistice business and political conditions in Europe have been such as to restrict our machinery exports thither in a serious way.

Latin America is now absorbing a much larger volume of American machinery than was the case in pre-war years, but the greatest expansion of all has been in trade with Asia. In 1922 the value of our machinery exports to Asia, while very much less than in the three preceding years, was still seven times as great as in 1910, or 1913, or 1915. The time has come when machinery manufacturers should carefully reconsider the extent to which they are justified in expending sales effort in non-European markets and particularly the Far East.

Source and Nature of Competition

In the machinery markets of the world American manufacturers have found their most important competition to be from European sources. In pre-war years Germany furnished perhaps 45 per cent. of the machinery that entered into international trade. As a result of the war and of recent events the nature of this competition is changing very rapidly. During the war this German trade was negligible, but following the armistice manufacturers there made an earnest effort to regain or improve upon their former export

position, and the daily press and trade papers have been publishing a large number of reports with regard to the post-war influence of Germany in the world machinery trade.

For a time the German manufacturers enjoyed certain advantages, particularly in connection with the falling mark, but during 1923 these conditions changed radically, and reports now received from practically all foreign countries indicate that, temporarily at least, German competition has lost its force. Speaking generally, German prices are now above world-market levels, and the exchange advantage of the mark has been lost. It would appear that the business formerly secured by German manufacturers is now open to producers in other countries, and American manufacturers should make plans to secure as much of this business as possible and during 1924 give particular attention to those markets that formerly depended largely upon Germany for engineering supplies.

To a certain extent France is benefiting from the above situation. Under the Treaty of Versailles and other international agreements France has greatly increased its productive capacity for iron and steel and manufactures thereof, and to a degree French competition in the international machinery trade has strengthened. Reports received from Italy and Spain indicate that French machine-tool makers are exerting a much stronger influence in those markets than was the case before. France also is now deriving certain commercial advantages because of the decreasing exchange value of the franc and, in a measure, is repeating the experience of Germany during recent years. French prices for machinery, bridges, etc., have been found very low when compared with those for similar products from other countries. It is not possible at this time to indicate the extent to which this situation will influence the nature of the machinery French manufacturers will offer in the world's markets or the length of time that they will enjoy a peculiar advantage because of currency depreciation.

Great Britain the Strongest Competitor at Present

Because of the conditions outlined above the world machinery trade is now largely in the hands of Great Britain and the United States, although a small amount of such business is done by Sweden, Belgium, Switzerland, Italy, and Japan. It would appear that for the immediate future American manufacturers will find their strongest competition from Great Britain, and for this reason particular interest attaches to reports received showing that British manufacturers are bringing out new designs, many of which follow the same general lines used by American manufacturers for years.

Labor has now become comparatively expensive in the United Kingdom, and shop equipment has been improved in an effort to reduce labor costs. In these respects British conditions are beginning to resemble those that have obtained in the United States for a long time. As a result that United Kingdom is more and more a market for the highest grade of machinery and the most refined types of labor-saving equipment, while gradually in the other markets of the world British designs are approaching those offered by Americans.

In general, European machinery is lower in price than American machinery, largely because of difference in design. As a consequence those buyers in foreign countries who consider only price will almost invariably purchase European equipment. This makes it necessary for the American manufacturer to put forth sufficient sales effort in the non-European markets to demonstrate to his customers the superior quality of his goods, and during 1924 he should arrange for educational campaigns to show potential foreign buyers why high-quality, high-priced equipment from the United States should be selected instead of cheaper but less refined designs from other sources.

Leading Markets Analyzed

Possibly it should be repeated that sales effort will ordinarily show the best returns in markets that are expanding, and it is seldom desirable to expend much work of this character in markets that are contracting. Even this rule is unsatisfactory, however, for there are countries in which exceptional conditions exist. China, for example, will probably not be found a satisfactory territory for unusual sales effort.

Applying the principle in a general way, however, during the current year manufacturers should give particular thought to the possibilities of expanding their business in Japan, India, the Dutch East Indies, and other Far Eastern fields. Also, in analyzing problems and developing sales programs for the current year, most of the news reports that are presented so sensationally in the press should be disregarded, as these frequently represent exaggerations.

Japan

In 1922 Japan ranked second among the markets for American industrial machinery, taking \$14,256,017 worth; in 1921 it was fourth, in 1919 fourth, in 1913 eighth, and in 1910 tenth, absorbing in the last-named year \$1,741,402 worth. Obviously, the Japanese market has been expanding rapidly, increasing not only in volume but in relative importance. Also, the American position there has been improving, the share of the country's business secured by United States manufacturers now being much larger than was the case in former years. American machinery is well known in Japan and enjoys an excellent reputation.

Heretofore the exchange situation also has been satisfactory. In 1923 (December excluded) the yen reached a high of 49.02 and a low of 48.03, showing an extreme fluctuation of only 2 per cent., and therefore not proving any serious obstacle to the conduct of business. Unfortunately, since the turn of the year and from causes largely growing out of the earthquake disaster, exchange fluctuations have been much more extreme and rapid, the yen having recently fallen to less than 44 cents.

Character of Demand by Earthquake

As a result of the earthquake there is a demand in Japan for a large volume of new construction, and it is to be anticipated that new methods will be employed in the rebuilding, creating a demand for mechanical equipment of many kinds. Until recently many of the industrial operations there employed methods that involved the use of a disproportionate amount of labor; but conditions are changing very rapidly. Since the earthquake, and for the first time,

motor trucks have been employed in large numbers for highway transportation. Other important changes are to be anticipated, but no one can say exactly what modifications will be adopted.

It would appear that machinery manufacturers of the United States should give careful attention to developments in Japan in order to take advantage of the situation and arrange for the introduction of their products. Japanese labor is no longer cheap, and there is every reason to expect the larger employment of labor-saving devices from this time forward. Tokyo and Yokohama will be rebuilt; their main thoroughfares will doubtless be straight, wide, and supplied with all the facilities known in the Occident; the buildings will be constructed along improved lines and in many instances of fire-resisting, if not fireproof, material.

But entirely apart from the influence of the earthquake the 1924 machinery trade of Japan will be important, for, it should be remembered, many of the country's chief factories were not within the affected area and there will be the usual demand for plant equipment by Japan's industries—industries that have shown remarkable development during the past two decades.

China

In 1922 China ranked fifth, absorbing \$8,251,768 worth of American industrial machinery; in 1921 it also was fifth, but the value was \$18,184,978. In 1919 it was seventh, in 1913 twenty-eighth, and in 1910 fifteenth, taking in the last-named year \$641,732 worth. It will be noted that the demand for mechanical equipment in China has expanded rapidly. American participation in the machinery trade of China also has increased, and a large volume of very attractive business has been secured from that area during recent years.

In connection with exchange it should be remembered that China is to a large extent on a silver basis. In the first 11 months of 1923 the high quotation for the Shanghai tael was 76.54 and the low 69.25, representing a fluctuation of about 9½ per cent., which is not abnormal for a silver country. If reference be made to the Mexican dollar in China, the exchange fluctuation was much narrower, being less than 3 per cent. All of these rates are above what might be considered par on the basis of pre-war averages, so that, so far as exchange is concerned, the situation in China is not unsatisfactory, although the rates are much lower than was the case shortly after the armistice.

Good Salesmanship Needed

Although the foregoing indicates that China is rather attractive as a market for American machinery, other information indicates that, in general, it is not so good a field for extensive sales effort. Final statistics are not yet available, but reports received suggest that this trade contracted sharply in 1923, and the end of the year found the market there dull with no outstanding features. The outlook for 1924 in the machinery trade of China is not especially encouraging.

Textile machinery forms a large part of the machinery trade there, accounting for a much greater share of the business than will be found in most countries. During recent months China's imports of cotton-spinning machinery have diminished markedly. This is an item of great importance, as China has of late absorbed a large volume of American textile machinery in addition to heavy purchases from British sources.

Although these facts would seemingly discourage sales effort in the China market, it should also be remembered that British participation in the machinery trade there has been increasing rather rapidly, making it necessary for American manufacturers to employ a high degree of salesmanship if they are to maintain their position in the market. China appears to be starting an important movement toward industrialization, so that sales effort, if expended at this time, will have greater effect on future business in that territory than a larger effort would have some years hereafter.

British India

India ranked seventh among buyers of American industrial machinery in 1922, absorbing \$5,390,227 worth of our equipment. In 1921 it ranked eighth, with \$10,772,891; in 1919 fifteenth, with \$4,822,136; in 1913 twenty-second, with \$628,063; and in 1910 nineteenth, with \$516,438. It would be difficult to find a market which has shown a more important expansion.

On the score of exchange, the high for the first 11 months of 1923 was 33.2 and the low 30.3, a fluctuation of less than 9 per cent., which should be considered peculiarly satisfactory because the exchange fluctuations in India in the period between 1918 and 1922 were very wide, rapid, and serious. A further factor of great interest is that India regularly has a heavy excess of exports to the United States, occupying in this respect a position that is the reverse of most of the European countries. This "favorable" balance should make it possible at all times for India to pay for machinery imports without difficulty.

India is definitely committed to a policy of industrialization and, it is anticipated, for an important number of years will be a steady purchaser of industrial machinery of many kinds. This is the sort of market where sales effort can be expended to good advantage. It is not possible to state in a few words the nature of the demand that will develop, but as India is a country about three-quarters the size of the United States, with three times the population, it will obviously have use for a very great variety of mechanical equipment. It is a market in which American participation is now relatively small, principally because the field has not been cultivated by American manufacturers. Like China, it is a territory where textile machinery has been imported in large volume, but American hydro-electric equipment, steel-plant equipment, railway equipment, machine tools, construction machinery, and many other lines are being used in India with excellent results.

Philippine Islands

The Philippine Islands ranked twelfth among purchasers of industrial machinery from the United States in 1922, absorbing \$1,632,404 worth. In 1921 the islands ranked eleventh, in 1919 eighth, in 1913 eleventh, and in 1910 eighteenth.

The currency of the Philippine Islands is based on the United States dollar, and exchange fluctuations are usually very narrow. For the first 11 months of 1923 the total spread was less than 3 per cent. Such slight variations do not interfere with commerce in any serious degree.

Business in the Philippines has been difficult during recent years. In 1919 American machinery was imported there in excess of \$10,000,000; in 1921 the value had dropped to \$5,529,555, and for 1922 the total was but \$1,632,404, as previously stated. Numerous influences have contributed to this result. The collapse of the sugar market that had such a strong influence in Cuba and Java and other sugar-producing countries about 1920 was felt in the Philippines also. Similar embarrassment was experienced in connection with the coconut-oil industry; important volumes of machinery for this industry were imported a few years ago, for which there is no longer a serious demand. In other ways the business situation has been difficult; but just as conditions have improved in Cuba, so is a similar but possibly less marked improvement to be anticipated in the Philippines.

Netherlands

With regard to the situation in the Dutch East Indies, it should be noted that this archipelago is one of the most important producers of sugar and rubber, and the recent improvement in world trade in these and other island products is having a beneficial effect on business there. There is reason to believe that the sugar machinery in Java has accumulated a great deal of deferred maintenance; the railways are in need of equipment, as are also the mining properties and the petroleum industry; public improvements have been delayed and will require construction machinery; along many other lines the archipelago is in need of mechanical equipment. These orders will be controlled to a considerable extent by persons in the Netherlands. Furthermore, this is a market in which Germany previously exercised great influence, and it would appear that the present is a time when American effort can be made there to advantage. Plans should be laid to give these two markets very careful attention during the current year.

Conclusion

The year 1920 was the best year in the American machinery-export trade, with a total value in excess of \$324,000,000. Since

that time there has been a decline, the total for 1922 being but \$112,000,000. Indications are, though, that the low point of the present depression has been passed, and from this time forward we may expect our machinery exports to increase in volume.

* * *

Worth a Trial

Withhold the Customs and Salt Surplus from Peking and Force a Conference

OVER a year ago we sat in a camp chair at Dr. Sun Yet-sen's headquarters on the outskirts of Canton and listened while he expounded his ideas for bringing about peace and unification to his country. Dr. Sun then saw what everybody is now beginning to accept as the only practical solution to China's difficulties. To his mind the first step towards reorganization of finances, funding of the public debt, disbandment of troops, construction of railways and development of trade and industry was a unified central government representative of all the provinces. Unification could be brought about, he said, only by calling a conference in which all the warring factions could meet and agree on some compromise that would result in united support to some scheme of representative government. If such a conference could not be held; if the militarists persisted in wrecking the country in pursuit of their own selfish ends, there was a way to bring them to their senses.

Dr. Sun adhered firmly to the belief that the power of the militarists would be broken when their main source of revenue was dried up. He declared that they were enabled to preserve their hold on the country solely because the foreign powers continued to recognize their puppets in Peking and to pay over to these collection agents the surplus customs and salt revenues, which, in turn, maintained their armies. If the powers declined to further pay these sums to Peking it would result in a speedy desire for unification. He further said that the powers could employ this surplus to pay off the unsecured foreign debt and any remaining surplus could be held in trust for a unified Chinese government.

Over a year has passed since Dr. Sun publicly expressed these views. It was largely to invite attention to this plan that he threatened to seize the Canton customs last November. While he may have been unsuccessful in precipitating intervention over this incident there is increasing evidence that his ideas are taking root and are now being advocated in quarters which in the past have been bitterly critical of Dr. Sun and his policies. Dr. Sun's threat to seize the Canton customs undoubtedly influenced the chairman of the Hongkong & Shanghai Banking Corporation to declare at the last annual meeting of shareholders that "any measure which by recognizing the claims of seceding provinces to a division of the customs revenue after international obligations secured upon it have been satisfied, would be a retrograde step in the direction of further disunion. As long as the Peking government continues to be recognized by the Treaty Powers as *de facto* government of the country, it must be entitled to receive the whole customs revenue. But, if its claim to do so is challenged by provincial secessionists and pressed by them to a point endangering the present administration of the customs service as defined by international agreements and the prescriptive agreements of sixty years, then the remedy would appear to lie in withholding the customs surplus from all the contestants to accumulate in reserve until they had composed their differences and military operations in all parts of the country had ceased. Such a step would, he believed, have the approval of all who sincerely desire to see the end of the civil strife now disrupting and ruining a great country which, with no external enemies but almost limitless potential resources, would be one of the most prosperous countries in the world."

This recommendation received the endorsement of the *North-China Daily News*, who said that "it was the only efficacious way of dealing alike with this question and that of the projected surtax." *The China Press* on April 17, also swung into line and accepted the program outlined by Dr. Sun and the chairman of the Hongkong and

(Continued on page 215).

Baron Hikokichi Ijuin

A Tribute to a Great Work Well Done

FEW indeed are the men in Japan who understand China and America as did Baron Hikokichi Ijuin, who died at his home near Tokyo on April 28 at the age of sixty. Japan loses one of her most efficient sons, China one of her best friends and America an ardent admirer. Baron Ijuin reached the top of the diplomatic ladder last

September when he was called from head of the Kwantung government general to direct the foreign relations of Japan in the Yamamoto cabinet. Here, with an efficient and loyal staff, every man of whom recognized the glorious opportunity to settle for all time the differences between their country and America, Baron Ijuin with his charming and frank personality welded the final link that he hoped would bind the two nations firmly together in a new understanding. From the empress and prince regent down through the cabinet officers and high dignitaries of the empire to the lowly laborer in the street, they accepted the great catastrophe as a blessing that ushered in a new era in the Pacific.

It fell to Baron Ijuin as minister of foreign affairs at this time of profound national sorrow to speak for Japan and transmit her sentiments to the American people through their representatives in Tokyo. How well he did it can never be fully appreciated by a persusal of official communications. Only those who stood with bared heads while Ambassador Woods turned over the huge American army hospital at Tokyo and Baron Ijuin accepted the gift in the name of his emperor, his government and his people, and listened to his brief halting, half-choked words of gratitude, can understand how deeply he felt at this moment, which to him symbolized the termination of a long-drawn-out period of misunderstanding; a successful outcome to the propaganda initiated under his personal direction in 1920.

Ten years ago western journalists labored under the delusion that the Japanese government conducted a highly organized and widespread publicity service designed primarily to conceal their real policies behind a screen of platitudes and official denials of facts. At that time Japan was facing the preparations of an old enemy to resume the conflict of 1905. The military element were in control and they found many good reasons why a large measure of censorship was necessary to prevent vital information from leaking out of the country. The dispelling of this idea of Japan's secretiveness was due largely to the wise and efficient supervision of the foreign office information bureau by Baron Ijuin on his return to Japan from the Paris peace conference where he represented his country as one of the delegates. Previous to this he had held the post of Japanese ambassador at Rome and directed the inter-allied Japanese intelligence work in Europe during the war. Close contact with allied intelligence and propaganda methods equipped him to apply similar efficiency in the conduct of Japan's post-war publicity.

We have several times come in contact with the much criticized Japanese propaganda system since Baron Ijuin assumed its direc-

tion; we have interviewed the officials of the information bureau of the foreign office from the highest to the lowest, and at all times have come away firmly convinced that it had only one fixed program. The high points of this propaganda were friendship with the United States and co-operation with Americans in Eastern Asia; sacrifices on the part of Japan to make the consortium a success; withdrawal from positions in China that would facilitate a better understanding with America in effect, a frank, friendly endorsement and cordial support to the policies of the United States.

Friendship with China was another cardinal feature of this new program but here its efficiency was impaired by a long series of misunderstandings, diplomatic blunders and regrettable incidents on both sides, aggravated by a hostile foreign opinion which influenced the Chinese to reject Japan's overtures for a better understanding. Japan's new policy towards China was modelled on the same lines as that of America, but owing to continued chaos, and internal warfare, it was difficult to apply any of the carefully considered plans that would carry conviction to the Chinese that Japan was their friend.

Baron Ijuin's oft reiterated advice still stands as the only solution to China's present problems and the inauguration of a new era in the relations between the two nations. "*Unite, Unite again and keep on Uniting*" was the message he sent at every conceivable opportunity to his Chinese friends through newspapermen who called to see him. It was good advice and not until China has a unified government representative of the whole country can Japan or any other nation manifest in a practical manner its real friendship for the Chinese people.

Open diplomacy, frank comment and friendly interviews with members of the Japanese and foreign press received its first trial in Japan under Baron Ijuin's direction of the foreign office information bureau. It worked wonders. The war cloud which hung over the Pacific paralyzing all constructive work was dispelled. Americans and Chinese alike awoke to a better conception of Japan's real aims and aspirations. To-day, she is better understood throughout the world than ever before. She has more friends, is more trusted and more highly appreciated since Baron Ijuin reversed her official publicity methods and took the world into his confidence.

Dyed-in-the-wool anti-Japanese will see nothing good in Japan's official propaganda. Many of her critics, however, are closely identified with Chinese propaganda and should the great Asiatic peoples become too friendly their usefulness would cease. Many Japanese editors and writers have severely criticized the publicity methods of their foreign office but all fair-minded foreign journalists will bear testimony to their efficiency. Five years ago when Baron Ijuin took over the direction of the official information bureau, Japan had few friends. World opinion was hostile; the public ready to believe any calumny upon her honor or exaggerated story of her activities. Never in history was a nation so isolated, so misunder-



Baron Hikokichi Ijuin

stood or so handicapped in placing her case before the world. Baron Ijuin learned during the progress of the great war that world opinion is moulded by the English language press. Unless this press be sympathetic, no government may hope for approval of its policies. In four years, however, the new policies of Japan, her frank and honest avowal of past mistakes and a willingness to correct them coupled with a sincere desire to work in harmony with the United States transformed world hostility into a sympathetic understanding and a growing esteem. To the liberal leaders of Japan belongs the credit for this radical change in policies but the foreign press will always remember that it was Baron Ijuin's intelligent grasp on publicity methods that supplemented their work and made success possible. It is one instance where enlightened diplomacy working hand in hand with open publicity has pulled a great nation off the rocks.

Baron Ijuin lived to see the war clouds which hung over the Pacific cleared away. He rejoiced in the new understanding arrived at with the United States. His great task, however, was only partially completed. Not until China and Japan are marching ahead in close companionship and mutual understanding towards their great destiny in Eastern Asia will his work be completed. That day will come. It will be hastened by the application of the same enlightened policies on the part of present and future cabinets backed up at all times by a confidence that the press of the world will concede fair play to Japan as long as her cause is just. Ijuin's work will live and Japan will benefit in the future to a still greater degree from the new conception of publicity gained as the result of his supervision over the foreign office information bureau.

A grateful sovereign has recognized his merit. Posthumous honors elevate him to the second court rank, the Grand Cordon of the Rising Sun with the Crysanthemum was conferred and a sum of money donated to his family. The honors that come after death would have come in due time had he lived. Because of the rare merits which enabled him to carry out successfully one of the hardest tasks confronting any government since the termination of the great war he would have continued to ascend the official ladder to its topmost round.

GEO. BRONSON REA.

Worth a Trial

(Continued from page 213).

Shanghai Bank and said "why shouldn't the powers exercise the control in their power and hold up this surplus and use it for refunding the defaulted obligations incurred by the Anfu and other militarists in recent years? Why not use it for that purpose instead of permitting it to be diverted for covering domestic bond issues the proceeds of which have likewise gone to military use?"

Discussions over what is the best solution for China's troubles have already exhausted every possible and every impossible plan. It has taken years to get down to fundamentals and a realization that no scheme of reform is possible without a central government receiving the allegiance, support and revenues from a united country that will permit it to discharge its international obligations. The conference scheme has been tried and failed.

The foreign governments, fearful of losing contact with the keeper of the Waichiaopu pigeon holes are inviting the ruin of their nationals in business in China by continuing to hand over the customs and salt surpluses to the collection agency maintained in Peking by General Wu.

Foreigners are loudly demanding some kind of intervention, sending letters to chambers of commerce and other influential bodies at home to urge their governments to act. Intervention is a serious undertaking and could not succeed without the cordial co-operation of the Chinese themselves. Something will have to be done to terminate the long-drawn-out agony and business stagnation. Dr. Sun Yat-sen knows his China. His ideas have been endorsed by the highest British financial and commercial authorities. THE FAR EASTERN REVIEW has advocated this solution as the one practical way out of the present impossible situation. The withholding of all customs and salt surpluses from Peking will have a sobering effect on the militarists and compel their attendance at a conference that will settle their differences. It is worth a trial.

G. B. R.

Largest Turbo-Generator Purchased by Japanese Company

THE largest steam turbine generator ever sold by any manufacturer in the world for export has recently been ordered from the International General Electric Co. by Mitsui & Co. for the Toho Electric Power Co. of Japan, and comprises a G. E. Curtis impulse type turbine, developing about 50,000 shaft horsepower, with a generator rated 43,750 kva., 11,000 volts, 60 cycles. The order, including accessories and switchboard, represents an initial capital expenditure of more than \$1,000,000. The unit will be located in the city of Nagoya, and provision is made for the future installation of an additional turbine-generator of same capacity.

The Toho Co., capitalized at approximately \$70,000,000, holds a controlling interest in the Daido Electric Power Co., which in itself is one of the most important electric power amalgamations in Japan. Both of these companies are under the executive leadership of Mr. Momosuke Fukusawa, often styled the king of the hydraulic power industry and pioneer of electrical development in Japan.

The purchase of this large turbine generator is typical and but another example of Mr. Fukusawa's progressive character as it was the Toho Co. that fostered and carried to completion the first "White Way" street lighting system in Japan—installed in Nagoya during the early part of 1923. Also in May 1923, at the Kawakami plant in the Kyushu district of the Toho Co., there was put in operation the first, and up to the present the only, automatic hydro-electric generating station in the Orient. The electrical equipment for these installations was also purchased either from the International General Electric Co. or its affiliated Japanese companies.

The Toho Co. practically controls the supply of power for lighting, industrial and railway purposes over a territory of approximately 13,000 sq. miles with a population of over 10,000,000. Their territory is divided into two main districts, Kansai and Kyushu. The former with its headquarters in the city of Nagoya (population 600,000) is the industrial backbone of Japan located in the central portion of the mainland and it is in this city that the present huge turbine will be located, while the latter is in the northern part of the island of Kyushu, west of the mainland. Up to April 1923 the Toho Co. owned 40 plants, steam and hydro-electric, with a total generating capacity of over 91,000 kilowatts which will be increased to over 150,000 kilowatts after the installation of the new equipments now on order. In addition, it purchases and redistributes from other companies over 45,000 kilowatts so that its influence on the industrial and social welfare of such an extensive community is of a most pronounced and vital character.

While this 43,750 k.v.a. turbine generator will furnish power for other than lighting purposes, it may help in visualizing its capacity to merely consider the small Japanese home with its average electric light consumption of about 35 watts, and to realize that this machine can supply enough power for 1,000,000 such homes.

The revolving field of the generator portion is made from a one-piece solid forging and is the largest and heaviest single piece which will be shipped. Its net weight is about 50 tons and approximate dimensions 27 feet by 4 feet diameter. In operation it will revolve at a speed of 1,800 r.p.m.

Recent orders placed with the International General Electric Company through their representatives, the Mitsui Company of Japan, covering a total of 78, 2,000 k.-va. transformers, seem to point to a tendency towards standardization in the reconstruction work in Japan. The last order, placed by the Tokio Electric Light Company, covered 23, 2,000 kva., 50 cycle, single phase units with a voltage rating of 22,000/11,000 to 3,450. This is the second order placed with the International General Electric Company covering this rating of transformer. The previous order has been shipped and covered 55 similar units.

Tramway Developments in Eastern Asia

OUTSIDE of Japan, electric tramway development in Eastern Asia has not progressed beyond Seoul, Dairen, Tientsin, Shanghai, Hongkong, Hanoi, Saigon, Bangkok, Singapore, Batavia and Manila. Several new propositions are on the tapis while those for Chinese cities seem to encounter one delay after another postponing their completion. A tramway system for Canton has been a dream for the past twenty years and enough money has been expended in surveys, investigation and bribes to build a fairly sizable line in that port. The tramways of Peking are now being built and will operate some day.* Application has been made to construct tramways in Hankow and there is a long-drawn-out discussion taking place in Hongkong as to whether tramways or auto-buses are best for Kowloon.

Manila Tramway Extension

Meanwhile some of the older established companies are expanding. The Manila Electric Company will add \$2,250,000 gold to its investments during the present year by lengthening its track 10 miles, purchasing 30 new cars and installing an additional 15,000 horse-power at its generating station. The present value of the company's holdings is P.30,000,000, P.10,000,000 of which has been added to the property account during the last 10 years.

The company has been able to reduce electric rates by 25 per cent. recently, placing them on a par with the average rate charged in the United States. This reduction has been effected by stokerizing the plant and introducing more efficient generating machinery.

In the transportation end the company has at present 52 miles of track and 148 street cars. These cars run 4,500,000 miles a year and carry 36,000,000 passengers or approximately 100,000 passengers a day. These figures show an increase of about 300 per cent. over first records.

The power plant has developed from a 2,300 horse-power installation, serving 3,478 customers to the present capacity of 20,000 horse-power serving 42,126 customers. With the 15,000 horse-power increase planned by the end of 1924 the company will be able to handle 50,000 customers.

The Manila Company employs 2,000 persons, with wages totalling P.1,800,000 a year, all of it spent in Manila. Local supplies purchased by the company amount to P.70,000 a month.

Trams versus Autobuses in Kowloon

The progress of the tramway scheme for Kowloon is shrouded in considerable mystery, but every now and then an insight is permitted into the working of the official machinery that gives a fair idea of how things stand. The fact was disclosed at the meeting of the Hongkong Tramway Company on February 27 last, says *The Hongkong Telegraph*, that a tender had been sent in by that concern for the rights of operating a system in Kowloon. It has been known for some time past that several companies have responded to the government's invitation for tenders, but there is still considerable doubt as to whether Kowloon will have any trams at all. The current colonial budget makes provision for expenditure in connection with the laying of the track, but from the remarks made at the budget meeting it would appear that the government itself is in doubt as to the relative merits of trams and motor buses. Before coming to a final decision the government is desirous of securing definite data on the comparative costs of establishing and maintaining tram and bus services, because this would be a factor in the eventual charges to be made to the public. It is for this reason that tenders were called for, says *The Telegraph*, the taking of such a step certainly does not imply that trams are to be decided upon."

"Our idea," continues this paper, "is that it would be a thousand pities to introduce trams in Kowloon. Apart from the disfiguring of the main roads of the peninsula, the adoption of such a system would not give the community nearly as good a service as could be obtained by motor buses, which are far more flexible and can be switched off to particular localities as and when the circumstances justify the tapping of new districts. There are many other reasons

which could be cited in favor of buses as distinct from trams, and we are not without hope that the government will soon finally resolve to abandon the tramway idea and take steps to assure the community across the harbor a modern and adequate motor bus service."

The question has evidently degenerated into a conflict between the tramway and motorbus interests with the government caught in the middle and hammered by both parties. *The Hongkong Daily Press* in discussing the Kowloon traffic problem admits that it does not know quite what the present position is with regard to the proposed tramways. In the last budget a sum of \$10,000 was provided "in respect of the laying of tramways in Kowloon," and in his general review of the budget, the governor explained that the proposal is that the government should lay the track and that the undertaking should be worked by private enterprise. Tenders had been invited accordingly. "The great demand which has sprung up in connection with the recently-established motorbus service," his excellency said, "is proof, if any were needed, of the necessity for finding an early solution for the traffic problem in Kowloon, and, if it should happen that satisfactory tenders in respect of a tramway service are not forthcoming, steps will be taken to establish a reliable service of motor-vehicles running to schedule and fixed fares to all parts of Kowloon and New Kowloon."

The Hongkong Tramway Co., in fact, have on many occasions applied to the government for a concession and were prepared to construct the tramway nine or ten years ago, but apparently the government's views as to the terms of the concession did not commend themselves to the company. In 1921 the government considered the question of a public motor service instead, and advertised for tenders. The Hongkong Tramway Company submitted a tender asking for a substantial subsidy, which they considered necessary to make a motor service on the conditions laid down remunerative. We do not know whether any other tenders were received, but no tender was accepted, and the motor-bus scheme was apparently abandoned in favor of the tramway project. Within the last three months we have seen an advertisement in Shanghai papers inviting tenders for the privilege of running a tramway service in Kowloon.

Meanwhile, "the necessity for finding an early solution for the traffic problem at Kowloon" is being increasingly emphasized. There is evidently more money in the motor-bus than the Tramway Company imagined when it asked for a substantial subsidy. It is no secret that the first motor-bus company which started in Kowloon found it to be a very profitable enterprise when once the management was entrusted to a competent European. The evident success of the pioneer company led to the formation of first one rival Chinese company and then another. At the present time three Chinese companies are operating in Kowloon, and we understand that they have between them some seventy or eighty busses. It is no uncommon sight to see from ten to fifteen of these queer-looking vehicles lined up at the ferry wharf competing for the traffic from the ferry. Presently the motor traffic on the streets of Kowloon is to be increased by a large number of taxicabs, and it has become high time that the government came to a definite decision as to regulating the traffic at Kowloon.

The motor-busses now in use are of a primitive type that we should like to see speedily eliminated. They have served a useful purpose in proving that a demand for this rapid means of transit exists, and these services, which have made the outlying parts of Kowloon more easily accessible, have no doubt encouraged much of the building development that is going on in what is called New Kowloon. But it is evident that fewer busses of a more commodious type would adequately serve the needs of the district. We notice that the pioneer company—the Kowloon Motor Bus Company—has just imported a greatly improved type of bus, capable of carrying probably forty passengers. It has not yet been licensed for service, as the authorities, we understand, are inclined to the view that it is too heavy for the roads, while the company's expert is trying to convince the authorities that its regulations in this respect would not be violated by the new type of bus, having regard to the distribution of its weight. We hope the roads of Kowloon are not so fragile as

* An article on the Peking Tramways will be published in our June issue.

to form an argument for the continuance on the roads of the slight, ramshackle-looking vehicles that now career over them. The need is obviously for busses of such a type as the one recently imported, but we imagine no company is likely to incur the expense of a fleet of such busses without the guarantees which go with a monopoly of the service. We take it that this is what the government had in mind when it intimated that if satisfactory tenders for a tramway are not forthcoming, steps would be taken to establish "a reliable service of motor vehicles," for it is a plain intimation that the government does not regard the present services as coming within that category. It is obviously desirable that the steps contemplated should include, amongst other things, a more modern and commodious type of bus than that now on the roads of Kowloon, and also fixed stopping places. We must confess to a wish to see this public utility in the hands of a British company employing a staff of competent technical experts, who could be counted upon to maintain the service in such a state of efficiency as the community has a right to expect."

Harbin Tramway Litigation

The situation surrounding the contract for the construction of the Harbin tramways seems to have been definitely settled by the signing of an agreement between the Beckman & Linden Engineering Corporation of San Francisco and the tramway commissioners making it impossible for the latter to assign, mortgage or otherwise encumber the original tramway concession granted to the American firm. The full text of this agreement reads:

"This agreement, entered into this 6th of April, 1924, by and between Suipandzi and the other concessionaires and The Chinese Harbin Electric Joint Stock Company, Ltd., first parties, and Beckman and Linden Engineering Corporation, second party, Witnesseth:

"Whereas, first parties, or one or more of them, are the owners of concessional rights, regarding constructing and exploitation of tramway and electric power plants for illumination of the city of Harbin, which concessional rights are set forth in a preliminary agreement between Harbin municipality and the above-named Suipandzi and others, dated January 24, 1922, which said preliminary agreement became final on July 1, 1922, Now therefore:

"First parties agree that they will not assign to other person or persons, either physical or juridical, their said concessional rights without first having received written consent of second party and that they will not mortgage or in any way encumber said concessional rights without first having received written consent of second party, and:

"Second party agrees that upon the repayment to it of all money with interest, paid or advanced in the furtherance of the physical work provided for in the said preliminary agreement dated January 24, 1922, then in that event and at that time this agreement shall cease and terminate and be of no further force and effect.

"In witness whereof, the parties hereto have set their hands and seals.

(signed) SUIPANDZI (Seal)

(seal of TSANG CHI-HUAI)

BECKMAN & LINDEN ENGINEERING CORPORATION,

By (signed) WILLIAM H. BISSETT, *President*.

Witnessed

(sgd.) LI SHAO-GEN.

Harbin, China."

The above document was signed at the office of the taoyin on April 6, and afterwards witnessed before the American consul by Mr. Li Shao-gen, foreign secretary to the taoyin. The document was then, on the same evening, filed with the city assembly. This document undoubtedly paves the way for some decisive action in starting work and smooths out the difficulties that have interfered with the American company in carrying out its contract.

Peking Tramway Troubles

The Peking electric tramway is being held up and lead-piped by the Peking chamber of commerce into paying a lump sum of \$120,000 to erect two industrial plants where ricksha coolies thrown out of work by the operation of the trams may find employment. An additional sum of \$5,000 a month is demanded to keep these in-

stitutions running. If not paid the tramway work will be boycotted by the chamber.

The Peking Electric Tramway Company is half government and half privately owned. It has a capital of \$4,000,000 divided into 40,000 shares of \$100 each, of which the Chinese government owns 20,000, the rest being subscribed for by private citizens.

The company is under the supervision of eleven directors of whom six are owners of government shares and five of merchants' shares. The directors for the government are appointed by the government, one of whom is the foreign manager of the Banque Industrielle de Chine. The directors for the merchants are selected from among the shareholders, each of whom must hold over 100 shares. The length of the term of office of directors is three years, subject to re-election. The chairman of the board is elected by the directors annually.

Two superintendents are in charge, one appointed by the government, and the other elected by shareholders holding over a hundred shares. Their respective terms of office are for one year.

After putting by a certain portion of the surplus for depreciation, within five years from the date of its formation, the company will pay the merchants' shares an annual interest at the rate of at least 5 per cent. on every share. In the event of the surplus not being sufficient to cover the interest of 5 per cent. the deficit will be made up by the government through other sources.

After deducting the depreciation and the 5 per cent. interest from the surplus of the company, over one-twentieth part of this surplus will be reserved as sinking fund, and the net surplus, if any, will be appropriated as follows: Shareholders' dividend, 60 per cent.; contribution to the public benefit of the city, 16 per cent.; bonus for employees of the company, 24 per cent.

All roads in Peking have been built and maintained out of license fees of shops and rickshas. During the past ten years over \$3,000,000 has been spent on road work in Peking. The chamber of commerce now demands that that \$3,000,000 should be refunded to them and they should not now pay any more license fees.

The Far Eastern Times says that a circular has been issued by the chamber of commerce, the Tramway Company had despoiled the hutongs and maloos built by taxes paid by merchants, and had laid rails through them, later offering to pay rental for the property over which their lines passed, promising that merchants should be exempt from further taxation as from January 1, 1924. The company, the circular adds, is now trying to evade these rentals, after much bargaining with the municipal council.

To what extent this passive resistance against payment of licenses will affect the company it is hard to say, seeing that all licenses are paid to the government, which, incidentally, owns half the shares of the company.

The attitude of the general chamber of commerce to the Tramway Company is that thousands of ricksha coolies will be thrown out of work. The Tramway Company points out, however, that the arrival of trams in Tientsin and Shanghai did not result in any reduction in the number of ricksha licenses, which were in fact considerably increased, this being due to the fact that several districts served by the tramway were incidentally opened to ricksha traffic.

It is stated that about eight months ago some prominent members of the Peking general chamber of commerce considered that they had a right to a certain number of free shares in the company. They moreover objected to the personnel of the board of directors, and as a result they bitterly opposed the advent of the trams. In addition to stating that ricksha coolies would be deprived of their livelihood, they declared that the roads in Peking were too narrow for tramway lines. The chamber of commerce has sent out over five hundred messages to jinricksha honghs in the capital instructing them not to apply for jinricksha licences, which were all due for renewal. This order will affect some 40,000 jinrickshas, and nearly 80,000 jinricksha pullers. The amount of the tax is 30 cents per jinricksha per month, aggregating \$12,000. The chamber of commerce intends to defy the police to enforce collection.

This action is taken in order to bring pressure to bear on the authorities to arrest the tramway scheme, and no matter what the upshot may be, this defiance of public authority in the capital is a very significant development.

Singapore Tramways

Rail-less Cars to be Operated

Negotiations between the Singapore municipality and the Shanghai Tramway Company, the conclusion of which will mark the dawn of a new era for traffic conditions in Singapore, are on the eve of completion, says the *Singapore Free Press*. Mr. D. McColl, the general manager of the Shanghai Tramway Company, is at present in Singapore for the purpose of discussing and settling various minor points in the negotiations. When these are concluded the work of removing the track of the present system, which has played such an effective part in bringing the Singapore roads to their present unsatisfactory state, and the reconstruction of the roads in preparation for the rail-less car service, which is to supersede the present system, will be immediately proceeded with.

Rail-less cars have been tried with considerable success in many of the principal cities in Britain. In no city has the service been more satisfactory than in Shanghai. Conditions here are more akin to Shanghai conditions than to those which exist in European cities, and there seems no reason why the success of the Chinese town should not be repeated in Singapore. It may reasonably be expected, at all events, that the change will have the effect of rendering possible the maintenance of better roads than Singapore is at present blessed with. Moreover, it should have the effect of reducing, if not entirely eliminating, the number of private-owned buses which render use of some of our principal streets an area of danger.

Route Reconstruction Begin

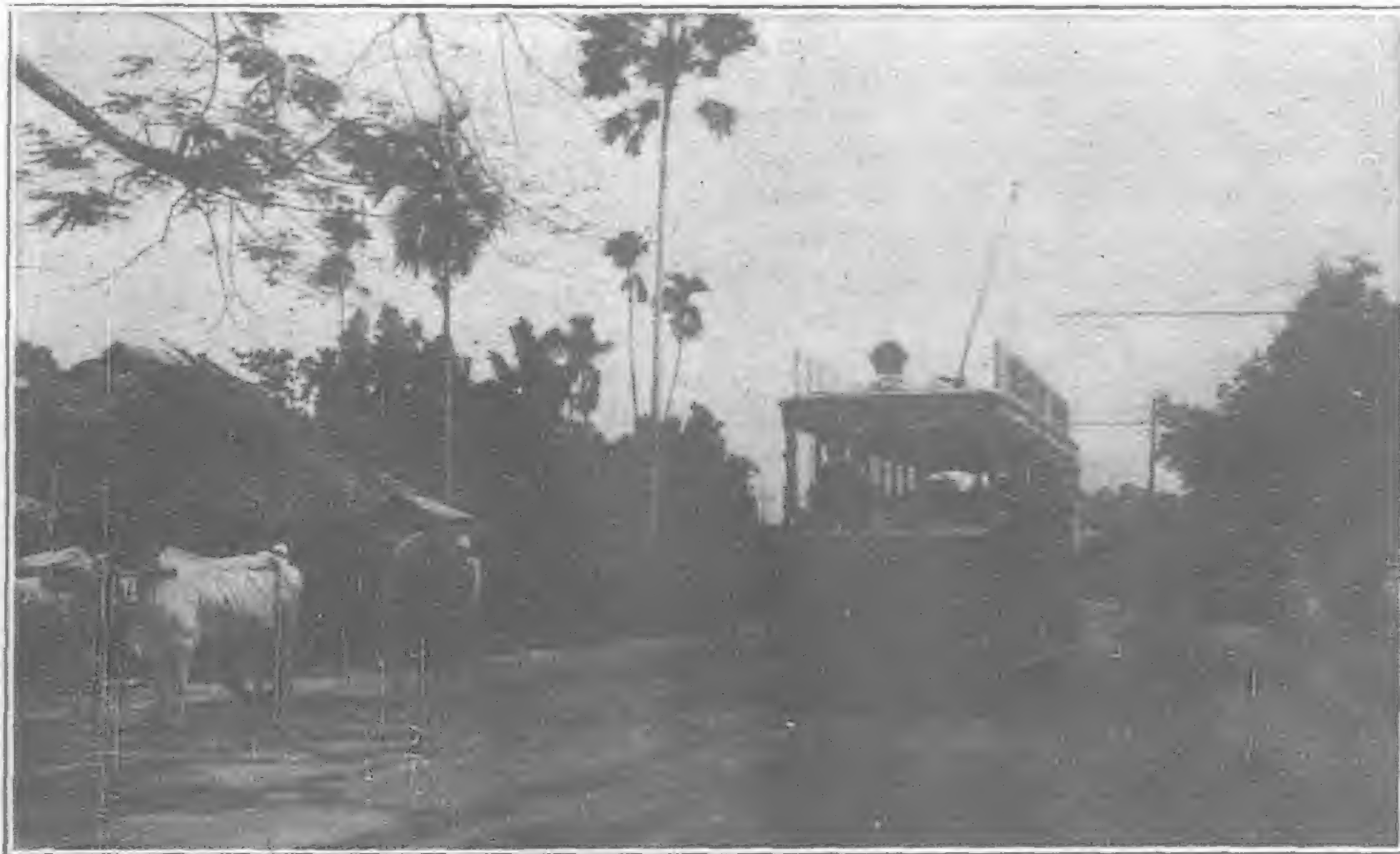
Details of the agreement that will finally be reached between the municipality and company are, naturally, not available for publication. It is understood, however, that the company will have full control of the service and will pay to the municipality a royalty of 2 cents per car mile, as well as 5 per cent. of the traction profits. It may, therefore, be reckoned that the company will pay a considerable part of the cost of raising the \$2,400,000 required to reconstruct the sixteen miles of tramway roads. It is anticipated that that work will be completed within the next three years. It will be necessary to reconstruct each road in sections. Work has already been commenced with the Geylang Road, where land is being acquired for widening purposes.

The tramway roads will be reconstructed in the same manner as that which is being used for the making up of a considerable portion of the new bridge road. This system, known as the Trinidad Asphalt system, is not a new one, but it has not been widely used in Singapore. It consists of the laying upon the ordinary block foundation a top surfacing of 1½ inches of asphalt "binder." That is rolled in and is followed by the laying of a 1½-in. surface of asphalt "sheet." The "binder" consists of a mixture of stone and sand in the proportion of 2 to 1, with the asphalt; whereas the "Sheet" is a finer composition of coarse sand from one of the Dutch islands, a finer sand from Paya Lebar, and asphalt. For the effective use of the system the plant which manufactures the materials must be within eight miles of the scene of operations. The secret of the efficacy of the process is in the fact that the materials are thus able to be brought direct from the plant to the site with little loss of their extremely high temperature—in the case of the "sheet" 300 degrees Fahr., and in the case of the "binder"

250 degrees. The materials are laid and rolled at this high temperature and the result, as shown, in the cases of Trafalgar Street—the road which leads to the municipality depot where the materials are manufactured—Alexandra Road and that portion of new bridge road which has been completed, is eminently satisfactory. A very hard and smooth surface is obtained, with more than a little resemblance to the solidarity of concrete. Unlike concrete, however, the asphalt can be laid with comparative rapidity. It is possible to open for traffic road that was laid on the previous day a feature of the process which should prove of considerable utility in the heavy program of work that is to be undertaken in the next few years. The new bridge road section had an unrehearsed test the other morning when a 12-ton roller and truck, with corrugated wheels, passed over a portion an hour after it had been opened, without harmful effect.

Improvements of the New Regime

The Shanghai company have been concerned with the management of the Singapore tramway system since October, 1922. Apart from the improvements that have been effected to the cars themselves, the following figures relating to the seven months from June 1 to December 31, 1923, are of considerable interest. They are of a character to induce some confidence in the ability of the new company to be formed in the near future to supply Singapore's transport needs adequately and with satisfaction. The number of car miles covered during this period was 914,408, compared with 693,723 during the same period in 1922. Although fares were reduced to such an extent as to work out at 3.75 cents per passenger, compared with 6.41 cents in the previous year, receipts increased from \$198,056 in 1922 to \$377,054 in 1923, an increase of 90 per cent. The total number of passengers showed an even more considerable increase of 225.62 per cent. from 3,090,795 in 1922 to 10,064,244 in 1923. For the first two months of this year the total number of passengers carried shows an even greater rise in comparison with the first two months of 1923, the figures being 947,672 and 3,279,531. Traffic receipts at \$118,587, compared with \$57,313 in the first two months of 1923 show an increase of 106.91 per cent., while the number of car miles covered indicates a greater service even than that of the last six months of 1923.

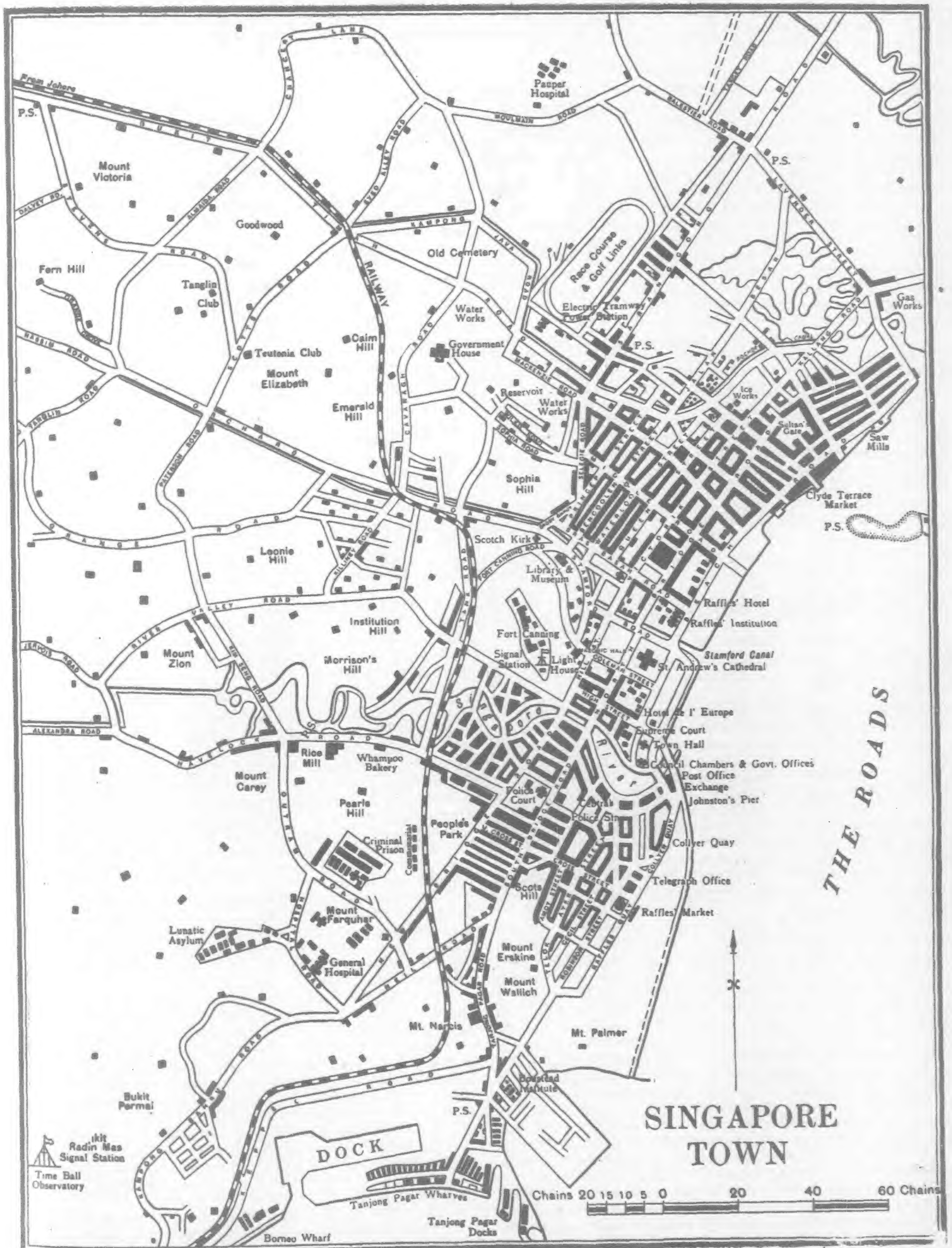


Type of Car operated in the Singapore Tramways

The Singapore Negotiations

The Singapore Company was registered in 1900; its only dividends, following a drastic capital re-organization in 1913, have been small payments made in 1916 and 1917. It has outstanding £271,700 of five per cent. debentures, interest on which is in arrear since 1921.

The company supplies the municipality with electricity and has suffered seriously from the continued operation of the power contract entered into with the municipality in 1913, the charges under which have remained virtually static in the period of high prices ruling since. The scheme now proposed is contingent upon the cancellation of that contract, and we understand that negotiations to that end and for the substitution of a new contract are well advanced. Indeed, an agreement in principle has been reached. The scheme now proposed involves the formation of a new company, to be managed by the Shanghai Electric Construction, Limited, and to be called the "Singapore Traction Company." The new company will have a capital of £400,000, one-half of which will be in preference shares, which, together with £103,000 in ordinary shares, will be allotted to the debenture-holders. The present ordinary



shareholders will receive 50,000 ordinary £1 shares in the new company, in the proportion of one new share for every eight old shares of 5s. each. The new company will obtain fresh capital by an issue up to £250,000 of debenture stock.

Projected Mukden Tramway

There seems to be a possibility of the old horse car line running from the S.M.R. station at Mukden to the main gate of the Chinese city being converted into an electric line but there has been so much backing and filling over this proposed change that it is still possible that it will again be deferred. However, we are informed by *The Manchuria Daily News* that the Chinese authorities, with the backing of the gentry, mostly members of the Chinese municipal council, have decided at last to construct a tramway within the walls. The streets from outer west gate to west gate being too narrow, the proposed tramway is to start from west tower (Lama tower) reaching the north-eastern corner of the walls via Shenyang railway station, whence, turning to the south, proceeding to west gate via outer west gate by a new road to be built for the purpose. The road along the walls is to be 52 yards; from the north-eastern corner of the city to Shenyang railway station, the new road is to be 28½ yards.

With the announcement of the above decision, the land-owners have been assured of receiving a reasonable price for land expropriated, and warned to lay no obstacle in the way of the construction of the new tram on pains of a penalty.

The example of Tientsin was held up as one worth copying. The idea was to raze to the ground the massive walls surrounding the city, in order to enclose the city with a peripheral line. But, Marshal Chang Tso-lin, the most powerful personage, in all Manchuria, equipped with the most progressive views, was the only dignitary who endorsed this idea.

The S.M.R. Co. proposed long ago to build a tramway from the railway station right up to the walls under Sino-Japanese

joint management. This proposition failed to be accepted, and the railway people are to look after the railway town, as the Chinese will do with the rest. This arrangement will create the necessity for a change of car, and is to be regretted on that account.

Iloilo Project

Another project which may eventuate in the near future is the establishment of an electric tramway in the city of Iloilo, in the Philippines. About a year ago a bill was introduced in the Philippine legislature authorizing the city of Iloilo to acquire, operate and exploit an electric street car plant and system within its jurisdiction and the vicinity. The corporation to be formed was to be semi-governmental, 51 per cent. of the capital stock to be owned by the city, or in case of inability of the city to finance the project, by the provincial government of Iloilo.

Dairen Tramway Expansion

The Dairen tramways operated by the electrical department of the South Manchuria Railway Company are also being extended to cope with the rapidly growing transportation needs of that port. During the last fiscal year the railway company invested the sum of Y.800,000 in bettering and extending its lines and has set aside another Y.400,000 for the current year, bringing the total investment up to Y.4,500,000.

Hankow Project

Chinese merchants in Hankow are promoting a tramway company with a preliminary capital of \$2,000,000, to operate a service, starting from the bridge, back of the Peking-Hankow Railway to Liu Kia Miao, near the Han River, a distance of 50 li. Rail-less trams will also be introduced. A plan has been drawn up and submitted for approval at the civil governor's yamen, Wuchang.

Cold Storage Plant for Manchuria

Japan's Future Meat Supply

THE entrance of the Kuzuhara Refrigerator Company, Ltd., of Tokyo into Manchuria marks another important step forwards on the part of Japan to solve the problem of her food supply. The people of Japan are turning more and more to beef to make up for the shortage in fish especially in the severe winter months when the catch is poor along the western coasts. The Kuzuhara Company one of the largest of its kind in Japan capitalized at Y.20,000,000, all paid up, has recently acquired the holdings of the East Asia Industrial Company in the Manchuria Ice and Cold Storage Company. The primary object of the Kuzuhara interests in invading this field is to operate several of its larger sized cold storage fishing vessels in the Gulf of Chihli, with Dairen as its base, but it will also push the export of Manchurian beef to Japan.

For a long time most of Japan's beef came from Tsingtao through the Okura Trading Company which operates the cold storage plant at that port.

The total value of beef exported from Tsingtao during the year 1923 amounted to some \$2,300,000, an increase of \$1,000,000 in comparison with the total value exported during the previous year.

The trade in beef is most brisk in winter, the cold weather assisting in keeping the quality intact until the time of delivery in Japan. This winter, the importers in Japan are vying with each other in an endeavor to show an enlarged turnover. Since the earthquake in Japan, beef, especially that imported from Shantung through Tsingtao, has replaced fish as the principal commodity, there being hardly an eating house in Japan that does not use beef as its chief item at present. In view of this increased consumption, dealers in beef in Shantung have found it difficult to cope with this demand. In the meat markets in Moji and Shimonoseki, the chief Japanese ports importing beef, Shantung beef stands unchallenged. The poor fishing in the neighboring waters of Shimonoseki, due to the cold weather, aids the marketing of Tsingtao beef in Japan.

From five to six hundred tons of beef are imported into Japan from Tsingtao on every steamer at the present time with the exporters clamoring for more space. In order to cope with the increased demand, a Japanese concern is starting to run a service of refrigerator ships, in addition to such well-known vessels engaged in

the trade as the *Hanamet*, *Nisshin Maru*, *Kaio Maru*, *Shikolan Maru* and *Hakuai Maru*. The *Neisei Maru*, one of the regular liners, operating between Tsingtao and Japan, will shortly be replaced by a larger steamer, the *Harada Maru*, which has some refrigeration facilities to offer.

Slaughter House Charges

The Tsingtao slaughter houses charge \$3 per head for slaughtering cattle and \$1.75 per head for pigs.

The slaughter house is a Sino-Japanese undertaking, with a capital of \$400,000. It is proposed that the company be turned into a public liability company, giving those who are not directly interested in the beef business a chance to participate as shareholders. Of the net profit of the company, 10 per cent. goes to the Chinese authorities who likewise impose an export duty of \$1.70 per head.

The Chinese authorities, following the indiscriminate killing of cattle, are now exercising strict control, in an endeavor to stabilize demand and supply.

The beef supply of Shantung is limited and it is from Manchuria and Mongolia that Japan must eventually seek its heavy food requirements. This must follow the installation of a large modern central cold storage plant and the adoption of refrigerator cars and space in steamships. It is here that the Kuzuhara interests will find an outlet for their activities.

The S.M.R. as usual is keeping in close touch with this development and its engineers have devised a new type of refrigerator car which may be converted at will into refrigerator or santhermic purposes.

On their trial test, the temperature inside the car was kept at 4 deg. C. while that outside happened to stand at zero. The interior of the car is lined on the sides and the roof with asbestos. Each car has a capacity of 22 tons (American) and is specially contrived to carry beef put out from 90 head of cattle, in quarters.

The novel feature of these refrigerator cars is, as above stated, to be converted for santhermic purposes, for instance, for carrying fresh fruits and like perishables susceptible to the freezing temperature.

Three more cars of the same pattern are being built at the Shakoku Workshops.

The S.M.R. has five refrigerator-cars in use and 10 cattle-cars.

When all these become operative, beef, pork, fish, fruits, and vegetables may be exported and imported without risk of damage being done to the perishables by the weather year in and year out.

Electric Locomotives In Japan

WHEN the early railways of Japan were built the 3-ft. 6-in. gauge was adopted as the standard, but as the traffic of the empire grew, the demand for movement could not be met by additional train service because of the limitations fixed by the gauge. The remedy lay either in the costly construction of additional trackage, change of gauge, or adoption of some type of motive power other than steam. For many years the question of changing the gauge to standard with its immense cost came regularly before the diet and it was only last year that this railway problem was definitely taken out of politics and a basic law passed fixing the gauge at 3-ft. 6-in. and authorizing a program for the electrification of the government railways in which the great water resources of the country will be called upon to furnish the power.

The congestion on the suburban lines of Tokyo was becoming particularly serious and this section was therefore selected for the initial electrification anticipating a greater volume of train movement in the near future with added traffic complications. One potent factor in arriving at the decision in favor of general electrification was the fast spreading development of hydro-electric power and the consequent possibilities for the conservation of the nation's coal supplies for industries which could only be operated by steam. The plans as perfected to date, call for the utilization of hydro-electric power during the next five years on from 500 to 700 miles of main line track.

The first step in this far-reaching plan was the electrification of the main lines out of Tokyo, where the local traffic conditions and the narrow gauge of the railway called rather for the operation of a number of light trains running at high speed at frequent intervals, than for a limited number of heavy trains at long intervals. After a careful study and investigation the 1,500 volt direct current system was decided upon as the basis of general railway electrification. It is now planned to handle the greater part of the passenger traffic by multiple-unit cars, reserving the locomotives for the long runs.

The present electric service between Tokyo and Yokohama is being extended to Odawara and a branch line from Ofuna, about ten miles from Yokohama, will terminate at the naval base at Yokosuka. The main line proper from Odawara westwards is also being electrified. In connection with this main line electrification the railway authorities have placed orders for several types of locomotives. Of these thirty six were ordered from the English Electric Company, two from the General Electric Company, two from the Westinghouse Electric Company and two from Brown, Boveri and Company.

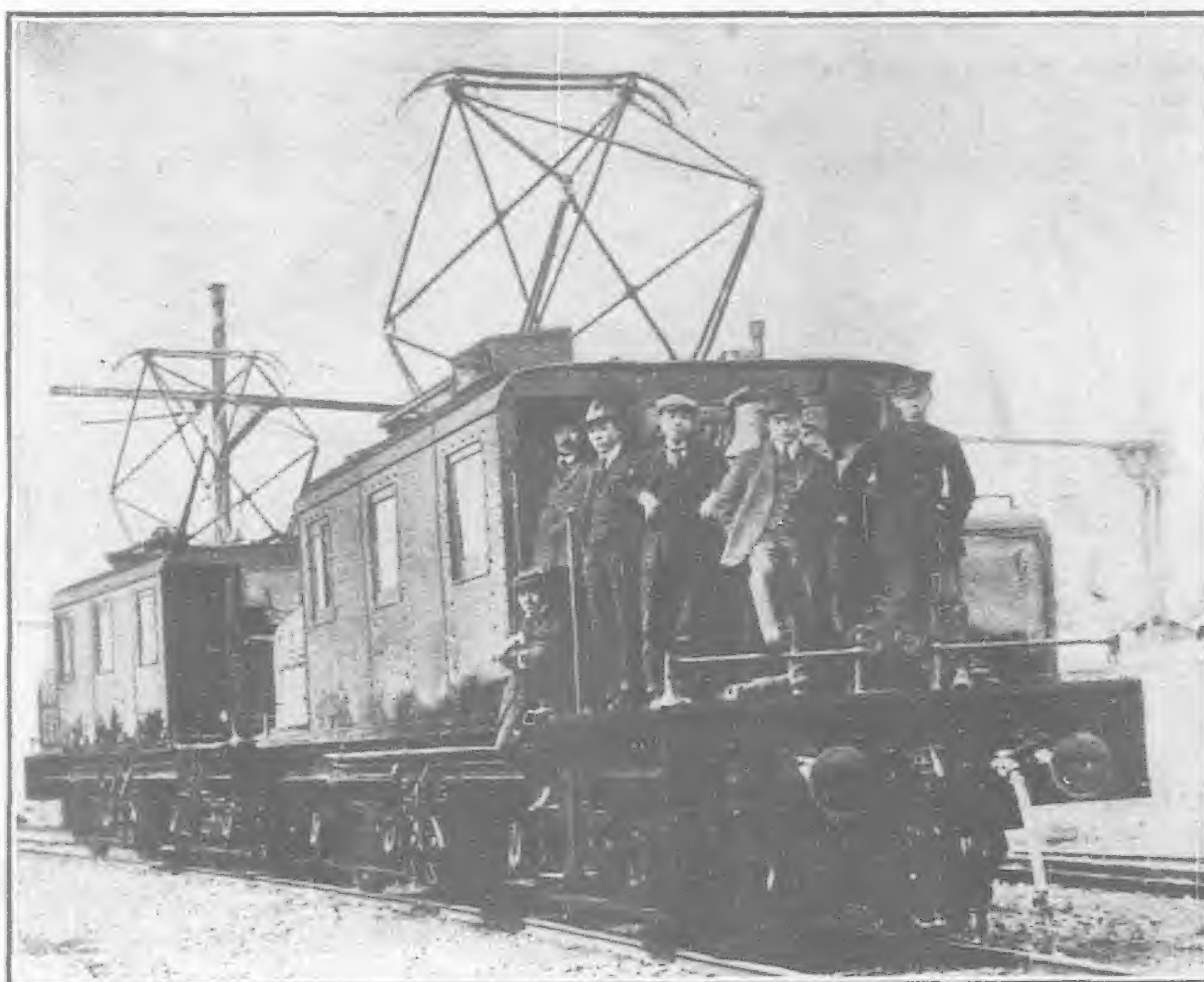
Eight of the locomotives from the English Electric Company are of the 4-6-4-4 type and the remaining 28 of the 0-4-4-0 type and have motor equipment of 1,200 h.p. The larger locomotives, the mechanical parts of which were made by the North British Locomotive Company, are to be employed in express passenger

service. When first they are put into operation they will take trains from Tokyo to Kozu, a distance of some 50 miles, stopping about half-way at Yokohama. Eventually, however, they will run to Odawara over the new direct route to Numazu, 80 miles from Tokyo and about 4 miles beyond Mishima, the connecting-point between the new line and the original main line.

As the gauge of the lines over which the locomotive works is 3-ft. 6-in., and as the service demanded required a high power, amounting to 1,800 h.p. at the one-hour rating, the question of the motor arrangement and drive required much consideration. The arrangement adopted will be clearly seen from Fig. 1 on page

The conditions imposed by the narrow gauge operated in the direction of limiting the size of motor which could be carried between the frames, and accordingly six motors were adopted. These are each of 306 h.p. on one-hour rating. The line pressure is 1,500 volts direct current, and the motors are of 750 volts each and are run two permanently in series. A gear drive is used, and the arrangement follows closely that commonly utilized in connection with multiple-unit passenger coaches. The whole motor and gearing arrangement is a simple and neat one, as will be clear from Figs. 1 and 2 in conjunction with the end view and cross-section given in Figs. 3 and 4. The general wheel arrangement is well shown in Fig. 1.

The underframe is carried on two trucks, each equipped with three driving axles and one swivelling bogie. The driving wheels are 4-ft. 7-in. in diameter,



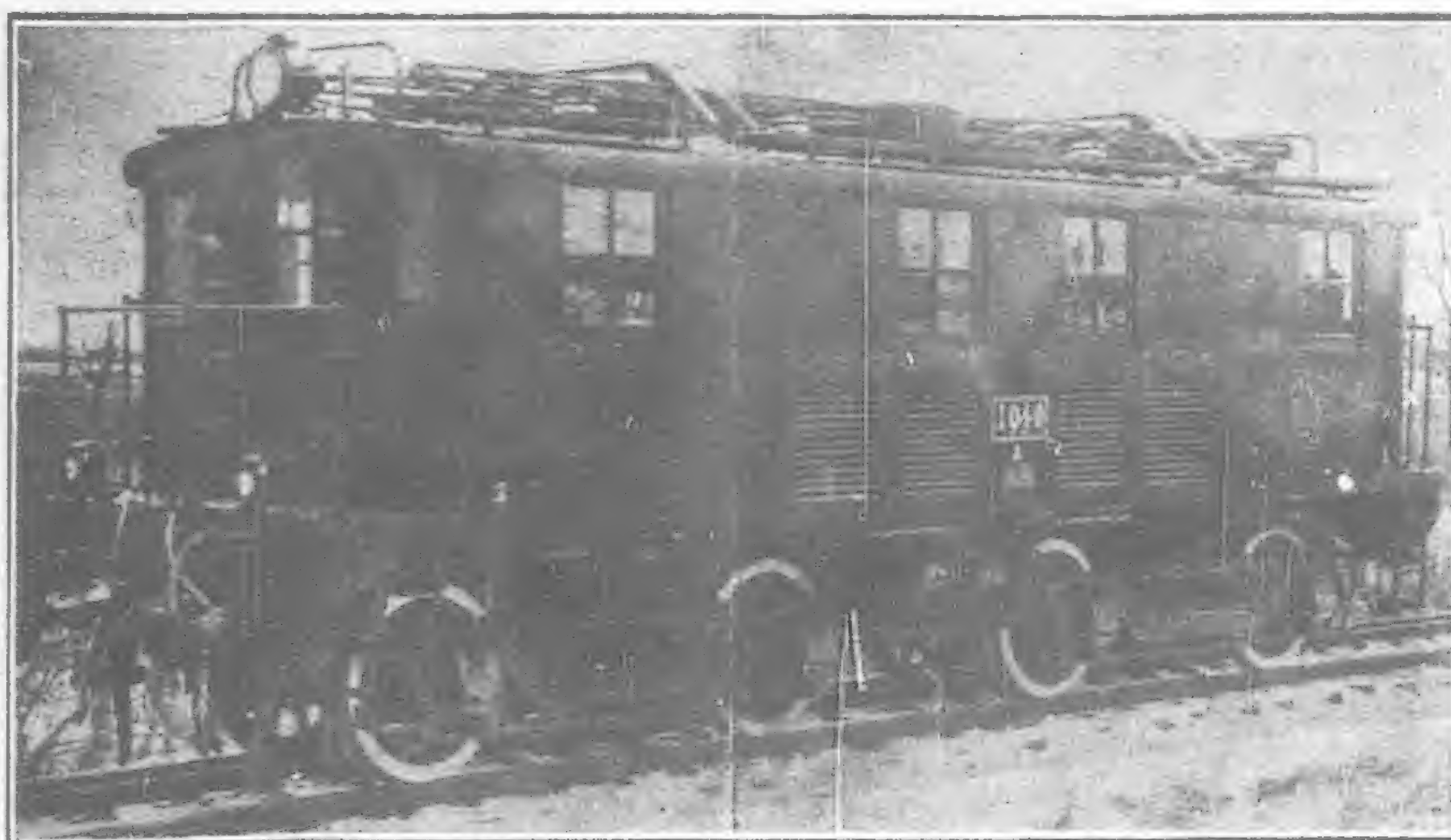
A Baldwin-Westinghouse Electric Locomotive on the Chichibu Railway, Japan

and the driving axles are each driven independently by a motor. The total weight of the locomotive is 100 tons, there being about 12 tons on each driving axle and 7 tons on each axle of the leading and trailing bogies. Compensation is provided between two axles only on each truck. As will be clear, the wheel arrangement of the locomotive is symmetrical about the centre line. The control of the locomotive is carried out on the English Electric Company's camshaft system. The electrical arrangements consist, briefly, of a main camshaft controller, and is operated by an electric motor which is controlled by a master controller. The camshaft controller handles the main 1,500-volt current, regulating the amount of resistance in the motor circuits and determining the grouping of the motors. It consists of a series of steel cams mounted on a mica-insulated steel shaft. The electric motor drives the shaft through a flexible drive and worm gear, and as the cams are set at different angles, each in turn closes a contactor, the contactors regulating the amount of starting resistance in the main circuit and determining the grouping of the motors. The order of operation of the contactors is determined by a purely mechanical arrangement, so that it is impossible for them to close in the wrong order and no interlocking arrangement is required. An interlock is, however, provided on the line switches, so that the camshaft cannot begin to rotate in a forward direction until the line switches have closed, nor in a backward direction

until they have opened. The main current is consequently always made and broken on the line switches only, and the camshaft contactors require neither blow-outs nor arc shields.

The apparatus in the main 1,500-volt circuit consists of the pantograph current collectors with choking coils, an isolating switch and main fuse, the magnetically operated line switches (which, as mentioned above, are interlocked with the camshaft controller), the camshaft controller itself, and the magnetically operated reversers, which are in the main circuit between the main motor armatures and the fields. They are indicated in the diagram of connections given in Fig. 5. The pantographs are raised by compressed-air cylinders operated from the brake compressor in the usual way. Each of them is capable of collecting the whole current required by the six motors. The high-tension control apparatus is situated in compartments arranged along each side of the locomotive body, as indicated in Fig. 4. Sliding doors are arranged to cut off these compartments from the remaining part of the interior of the locomotive body, and the doors are interlocked with the main isolating switch, so that it is impossible to obtain access to the high-tension gear when it is alive. The switches have magnetic-shield blow-outs and are closed against a spring, so that there is no time lost in opening.

The control current is obtained from the 100-volt side of a motor generator which is in the centre of the locomotive body, and can be seen in Figs. 1 and 2. Current is taken from this generator to the master controller at each end of the locomotive. The two controllers are similar, and the locomotive may be driven from either of them. From the master controller current passes through



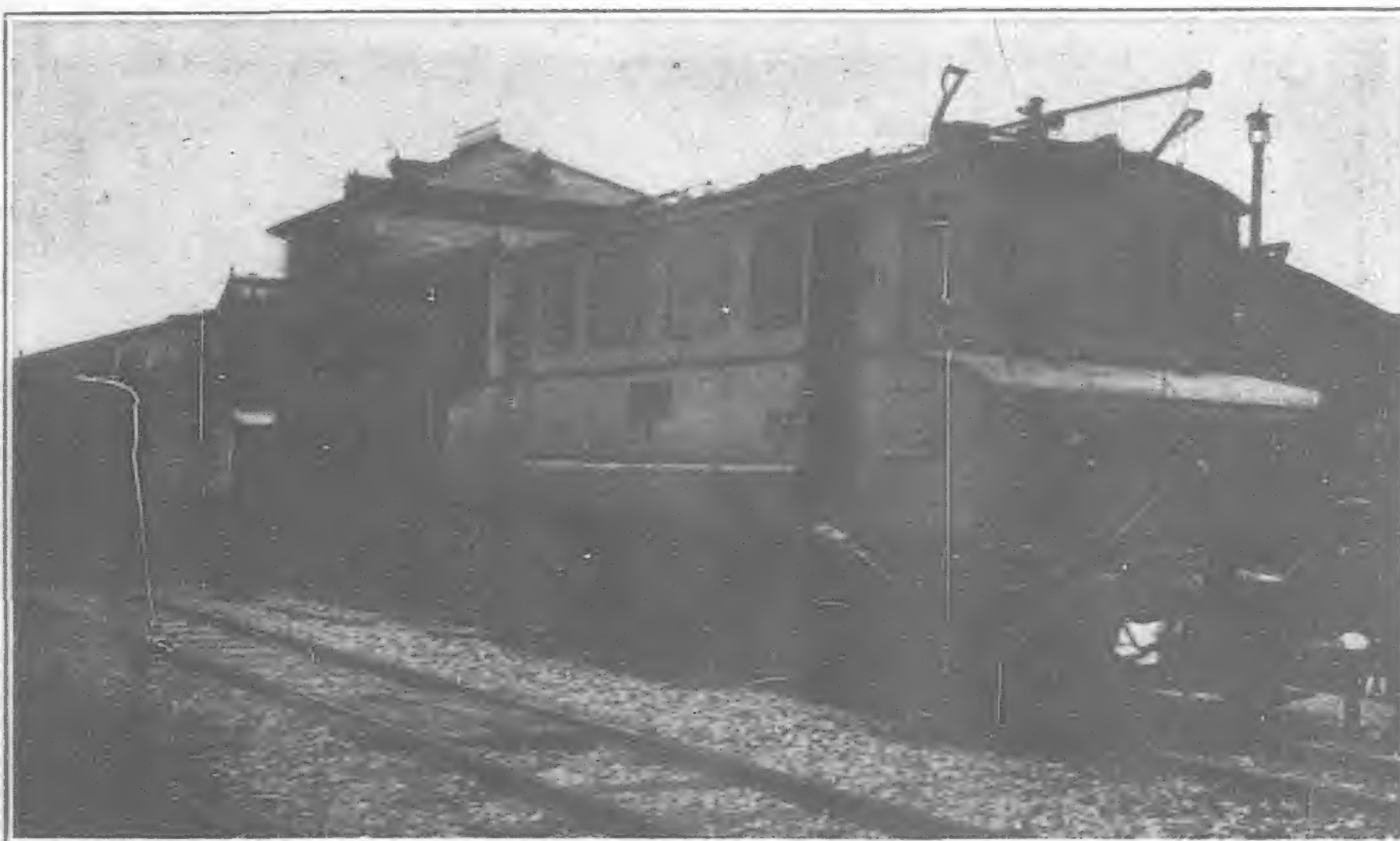
1,500 volt, 1,040 h.p. General Electric Locomotive for the Imperial Japanese Government Railways

short-circuiting brings the camshaft to rest instantly and without any hesitation or over-running. A 20-volt relay is provided in connection with the control circuit, and if the line supply fails the

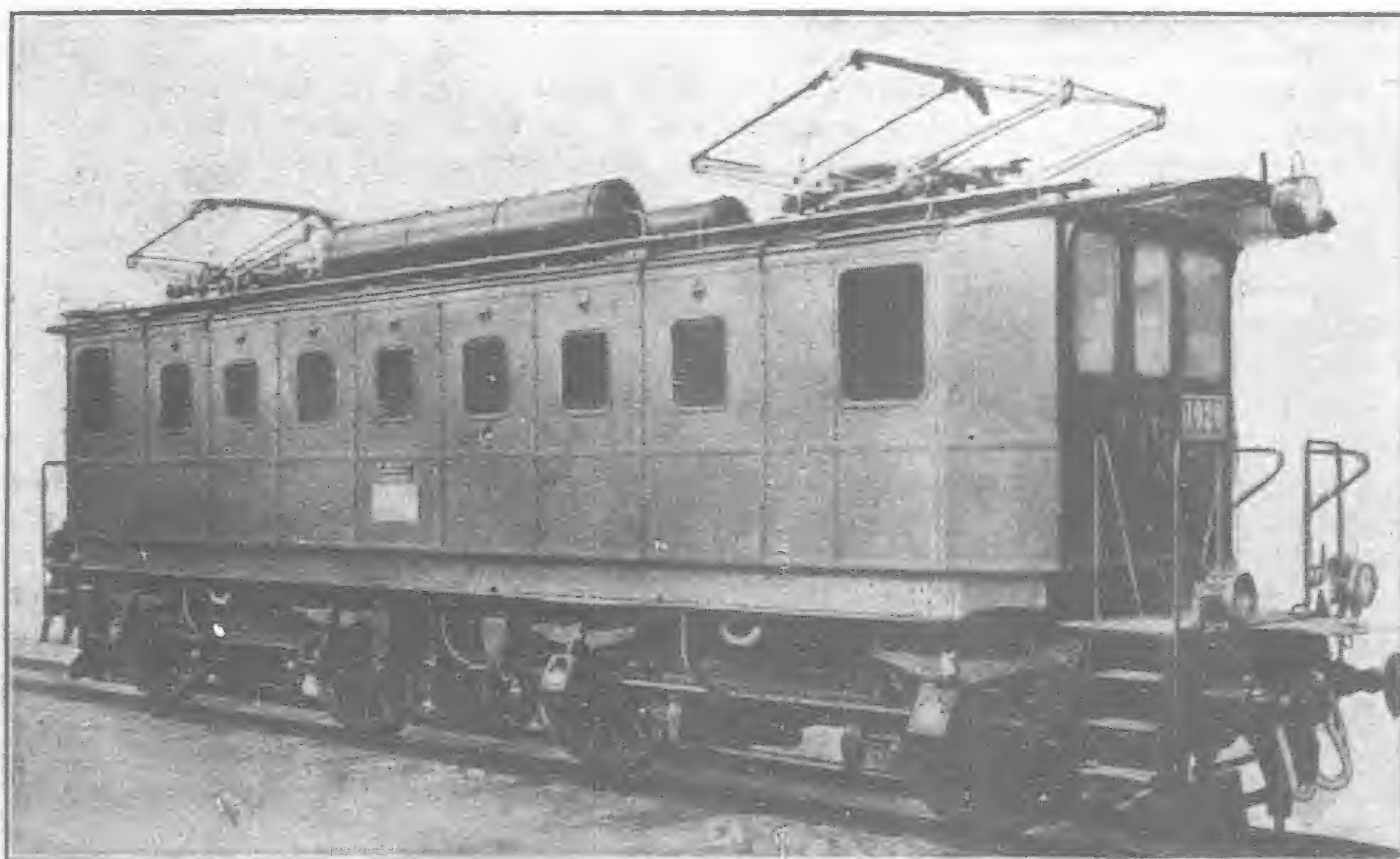
the train wires to the position regulator on the camshaft controller, and from thence to the motor which drives the camshaft controller. The position regulator is in the form of a drum-type switch. As the master controller is operated, the camshaft-controller motor is started and moves the camshaft controller into the position determined by the master controller. When the camshaft controller reaches this position the armature of the camshaft motor is short-circuited by a relay, the energising of the relay being determined by the position regulator. This

master controller must be brought back to the starting position, before power can again be supplied to the main motors when the supply is restored. The line switches are tripped when the master controller is brought into the zero position. These switches are provided with an overload relay which is closed from the driver's compartment. They can only be closed when the master controller is in the zero position.

The motor of the motor-generator set is fed from the 1,500-volt line. The controlling apparatus consists of an isolating switch interlocked with the door of the high-tension compartment and an automatic starter consisting of three small contactors and a starting resistance. A reverse-current relay is incorporated in the circuit, since if the live voltage dropped suddenly the inertia of the set would cause the motor to feed back into the line. This relay inserts resistance in the circuit and safeguards the motor. This motor of the motor-generator set, besides driving the 100-volt generator which supplies the auxiliary circuits, also



One of the A. E. G. Electric Locomotives placed in operation on the Yokozawa-Karuizawa section of the Imperial Japanese Government Railways in 1912



One of two Brown Boveri Electric Goods Locomotives supplied to the Imperial Japanese Government Railways in 1923. 1,380 h.p., 1,500 volts, direct current

1,800 H.P. 4-6-6-4 TYPE ELECTRIC LOCOMOTIVE FOR THE IMPERIAL JAPANESE RAILWAYS

BUILT BY THE ENGLISH ELECTRIC COMPANY, LTD., LONDON

(From Engineering)

Fig. 1

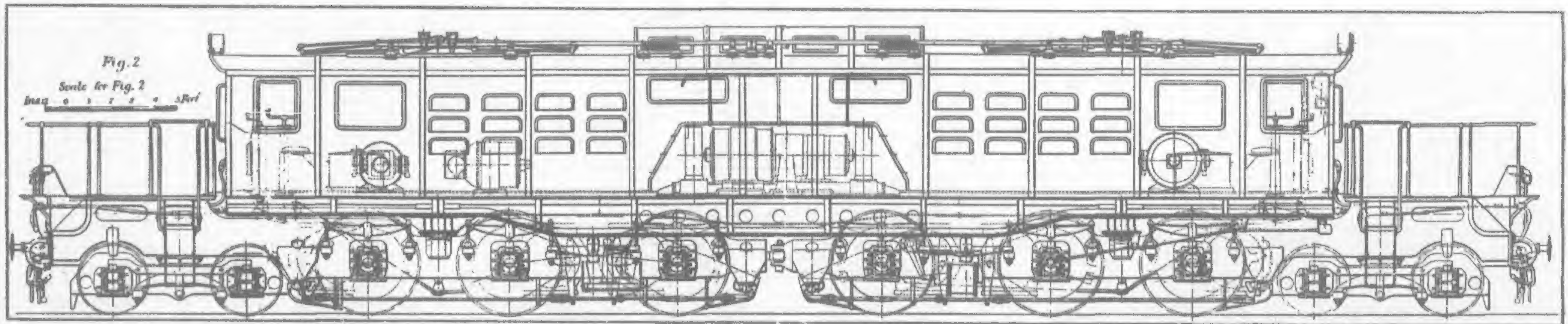
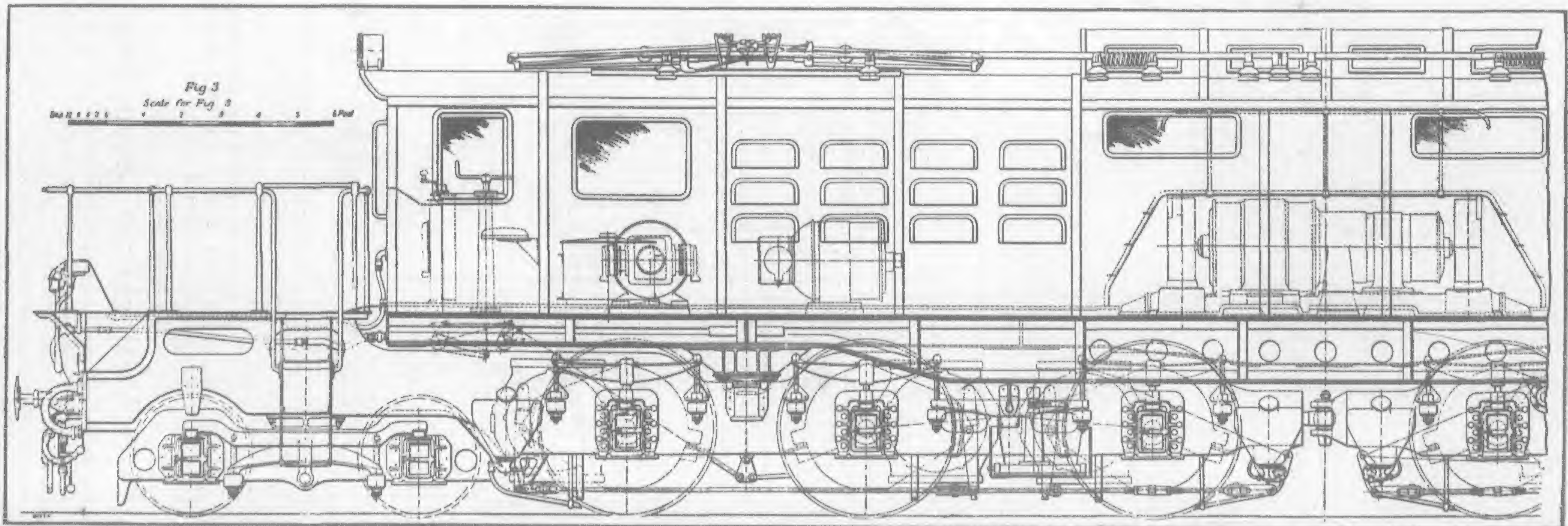
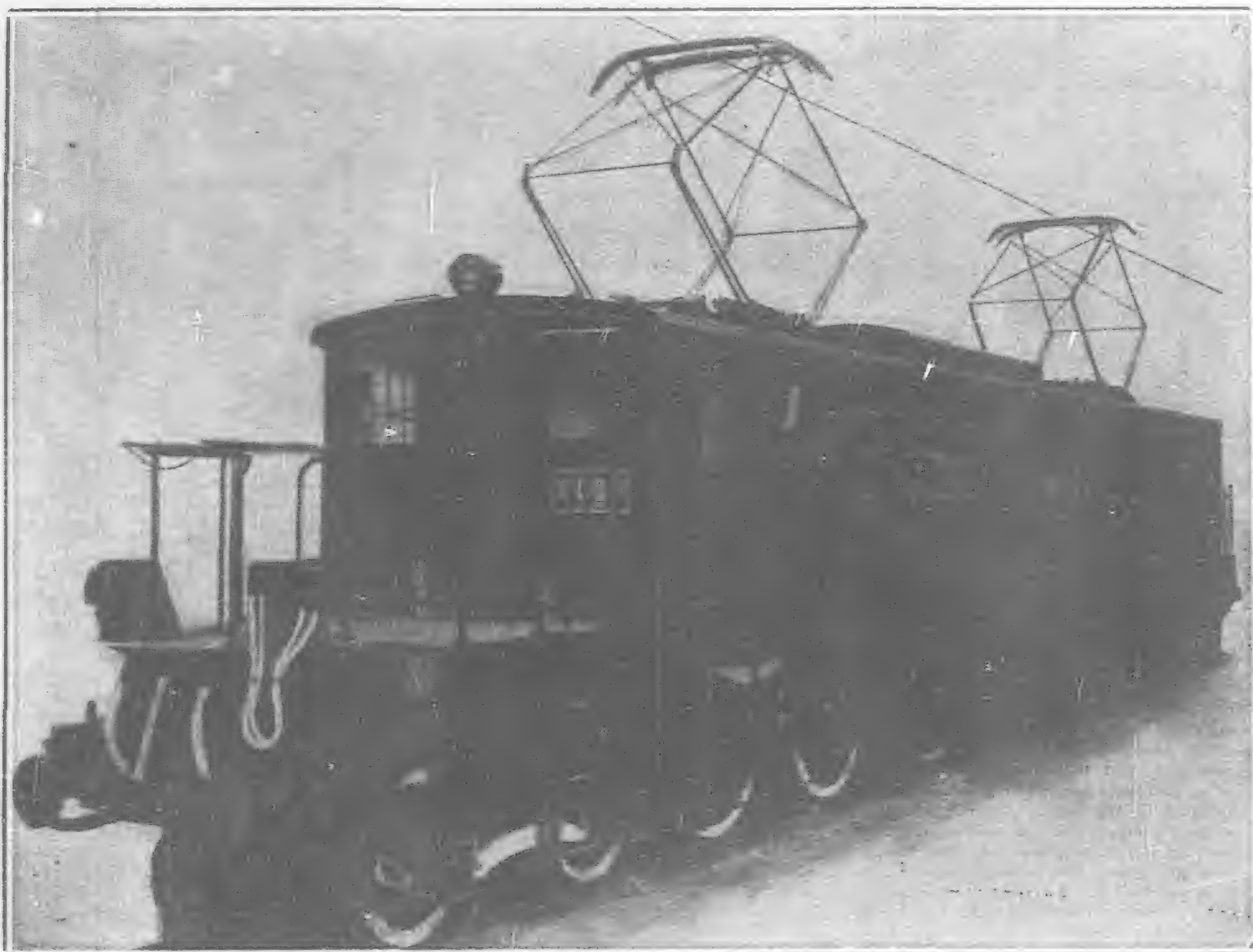


Fig. 2





English Electric Company Locomotive for the Japanese Railways

drives two fans which are carried one at each end of the set, as shown in Figs. 1 and 2. These fans supply forced ventilation air from the main motors. A stand-by supply for the auxiliary circuits is furnished by a battery carried by the locomotive, this battery having sufficient capacity to operate for four hours in case of failure of the motor-generator set.

The locomotive is fitted with automatic air brakes, and the compressor motors are supplied from the 100-volt auxiliary circuit. A vacuum exhauster is also driven from the same circuit. This exhauster is required for use in connection with the operation of the vacuum brakes on the existing passenger stock. Ultimately it is the intention to change over all stock on the Japanese railways to compressed air brakes, and when this has been carried out the exhausters will be removed from the locomotives. Two or more of these locomotives can be run in multiple unit and driven from a single master controller. The draw-gear and couplings are made to the Japanese railway standard, but arrangements are made so that the present gear can be removed and M.C.B. couplers fitted if desired.

Baldwin Westinghouse Locomotive

The two Baldwin-Westinghouse electric locomotives furnished to the Japanese government railways are now in service near Tokyo. Designed primarily for local freight service over lines having heavy grades they may be operated in multiple as a road freight locomotive of 121 tons dead weight. Following are the principal dimensions of the two locomotives: Weight, 120,950-lb.: Weight per

driving axle, 30,240-lb.: Diameter of wheels, 49 in.: Rigid wheel base, 9-ft. 1-in.: Total wheel base, 29-ft. 4-in.: Maximum speed, 40 m.p.h.: Starting tractive effect, 30-240-lb.

Two axle hung motors, inside hung and direct geared to the axle, are carried on each truck. These locomotives will be given close supervision while in service with a view to the acquisition of data concerning actual traffic requirements as well as of operation before determining the extent of the general electrification and the type of equipment on the government lines.

In addition to the locomotives supplied by the Baldwin-Westinghouse companies to the government railways several are in operation on the Chichibu railways, a system traversing a district rich in the natural wealth of mines and quarries and noted for its production of raw silk.

For many years this railway was operated under steam power, but increasing freight movement and the ever-present fuel problem made it imperative to seek a solution of the power difficulties. Moreover, the development of electric plants in this district had been rapid and an ample supply of current was ensured. After a careful consideration, therefore, of all the operating factors, a decision was made calling for the electrification of the line from Kagemore to Kumagaya, a distance of 35 miles of main line.

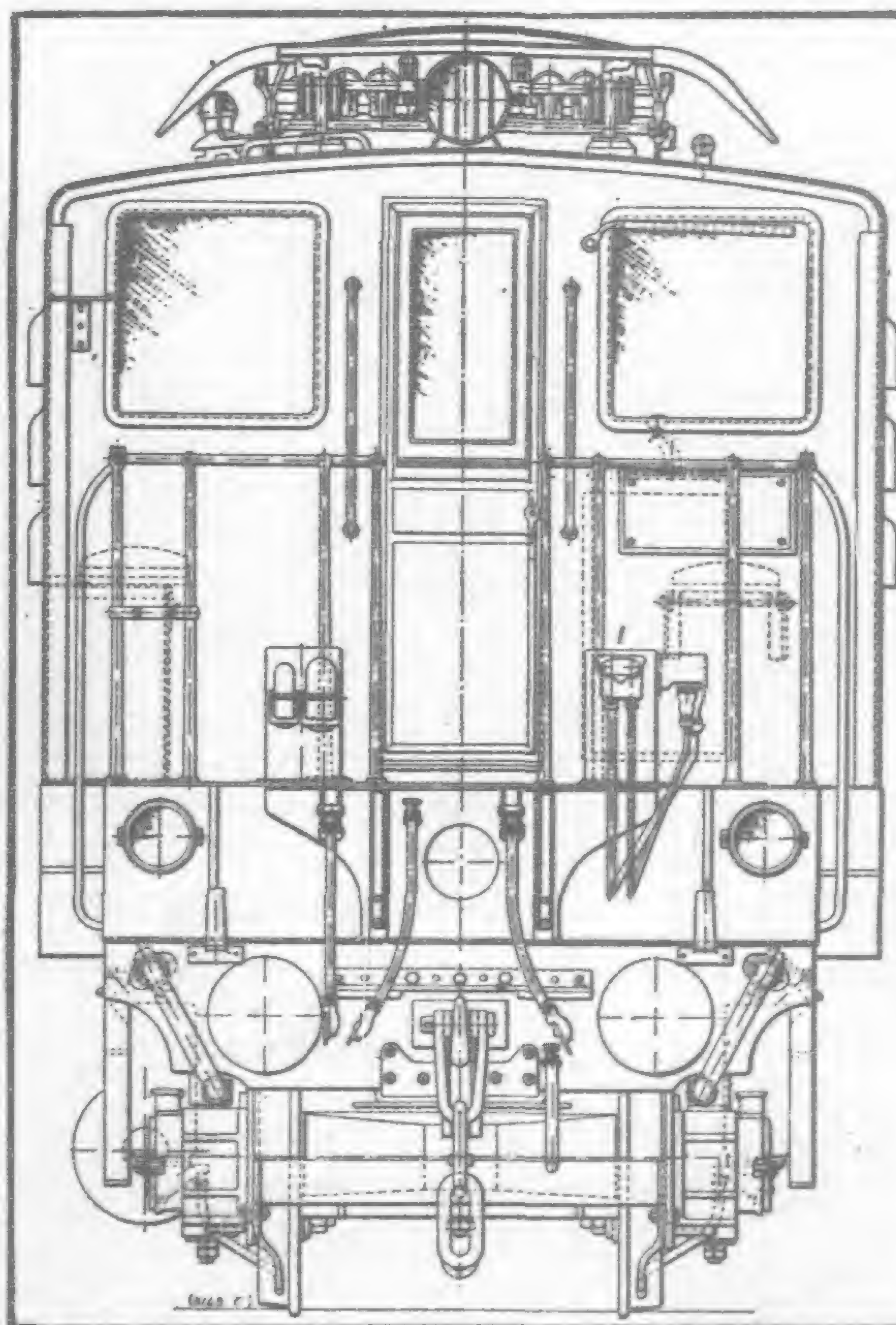


Fig. 3

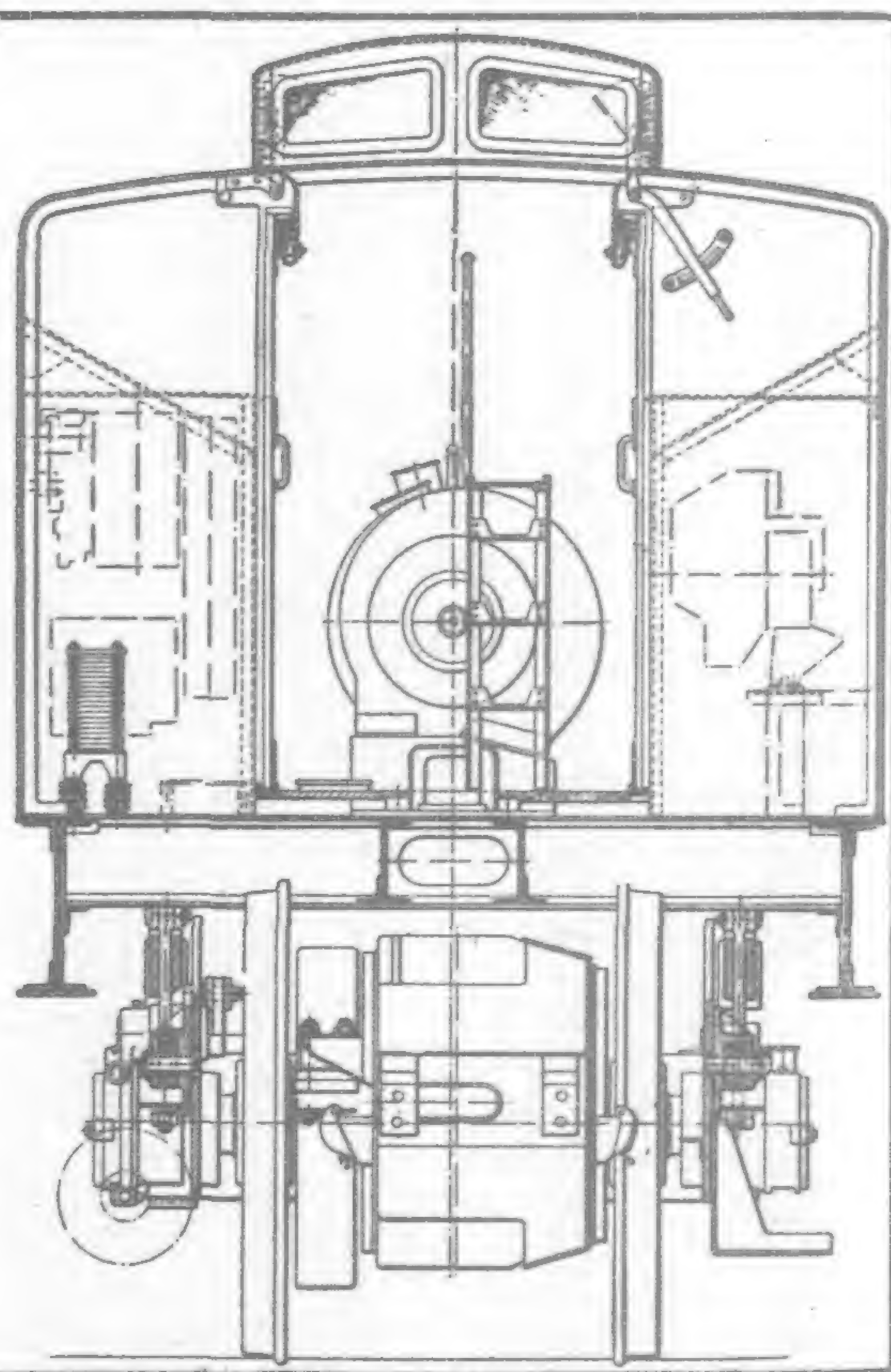


Fig. 4

Power is supplied by the Musashino Electric Power Company, transformed through two substations to 1,200 volts direct current.

Three multiple unit cars, equipped by the Westinghouse Company, will be operated in passenger and express service. Five Baldwin-Westinghouse electric locomotives were shipped in October 1922, to handle mixed freight and passenger trains, which as a rule consist of four passenger cars and fourteen goods cars, making a total of approximately 204 gross tons. The electric locomotives are of the 0-4-0+0-4-0 non-articulated type, built for 3-ft. 6-in. gauge track with 38-in. wheels. They weigh approximately 82-150-lb.

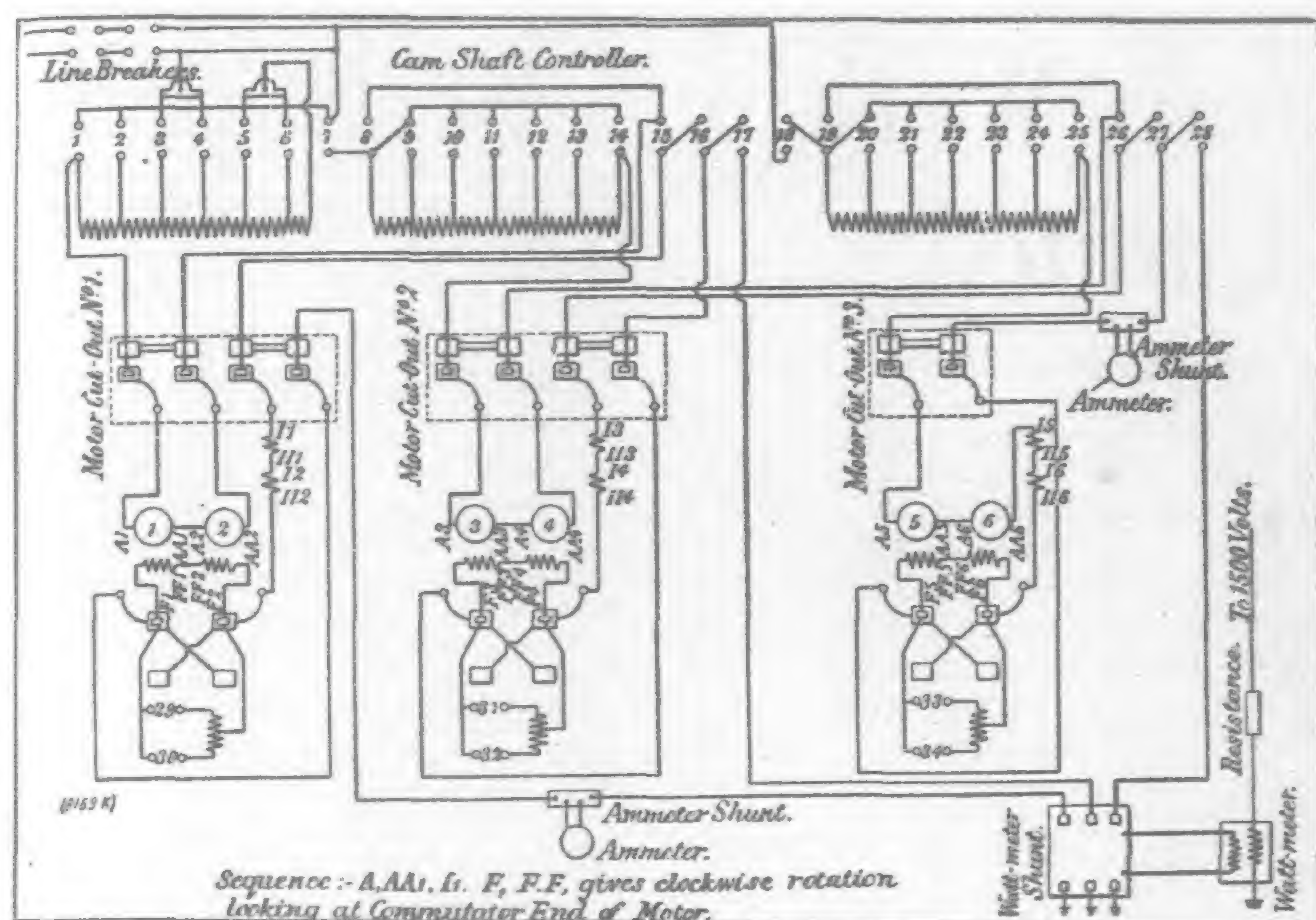


Fig. 5

The latest activity of the Dock is the securing of an order from Messrs. G. S. Yuill & Co., of Sydney for two vessels to go on the Hongkong Australia run. These boats will be about the size of the Changsha and Taiyuan which they probably will replace, as the two vessels have been on this run for almost 40 years. The new steamers will be about 350 feet long and have accommodation for 50 first, 30 second and 20 third class passengers. The steerage will be fitted to take 200. The cargo capacity will be 4,000 tons with two holds fitted as refrigerators for frozen meat.

General Electric Locomotive

AT the same time that the order for the English electric locomotives was placed the Japanese government railway administration ordered two from the General Electric Company of New York, two from the Westinghouse Electric Company and two from Brown, Boveri & Company. The General Electric locomotive illustrated on page — was made at the Erie works of this company and is of the box-cab type, equipped with four GE-274 750/1,500-volt motors, geared for a maximum speed of 40 m.p.h. Its total weight is 132,000-lb., all on driving axles, and it is capable of exerting a tractive effort of 17,000-lb. on the one-hour rating. The continuous rating gives a tractive effort of 17,400-lb. at 22 m.p.h., with 1,500 volts on the trolley. In addition to the 1,500-volt rating the locomotive can be operated at 1,200 volts at a somewhat reduced capacity, and provision is made for operation at 600 volts direct current by the throwing of a commutating switch which connects all four motors in parallel. They are permanently in series for 1,500-volt operation. Protective devices are supplied to prevent damage due to accidental contact with the 1,500-volt trolley when the commutating switch is thrown to the 600-volt connection. The leading dimensions of the locomotive are as follows:

Length over all	..	..	..	37-ft.	2-in.
Length of wheelbase	..	..	..	26-ft.	0-in.
Rigid wheelbase	..	..	..	8-ft.	6-in.
Height over pantograph (locked down)	..	..	..	12-ft.	10-in.
Diameter of wheels	..	..	..	..	42-in.
Gauge of track	..	..	..	..	42-in.

The GE-274 motors were designed especially for this locomotive and are the largest so far constructed for a 42-in. gauge track. Each motor rates 260 h.p. on 750 volts, and is insulated for operating two in series on 1,500 volts. The motors are arranged for ventilation by means of external blowers.

One of the most interesting features of the equipment is the new electro-pneumatic type of control known as Type PCL. Two master controllers, one in each operating cab, energize the magnet

valves of the pneumatically operated contactors, which open and close the main motor circuits. These contactors are closed by air pressure and opened by a heavy spring acting against the pistons. control steps are provided with four motors in series and eight steps with the motors in series-parallel.

Another important feature of this equipment is the high-speed circuit breaker, which is connected between the trolley and the main part of the locomotive equipment. Under normal operating conditions this circuit breaker is closed automatically on the first point of the master controller; it then remains closed unless tripped by an overload or short circuit or by momentary loss of the control circuit voltage. After being tripped for any reason, the breaker is again reset upon the first point of the master controller. Under normal operation, however, the high-speed circuit breaker does not open with the return of the controller to the off position. This circuit breaker has no mechanical latches or triggers, but is tripped electro-magnetically. This construction makes for durability and permanence of calibration.

To protect the locomotive motors against damage due to overload, an overload relay is provided, which is so connected that in case the motor current exceeds a certain predetermined value, the relay contacts open the holding circuit of the high-speed circuit breaker, which then opens and thus relieves the overload.

For collecting the 1,500-volt current, twoslider pantograph trolleys (one a spare) are provided having a range of 7-ft. from minimum to maximum height. These pantographs are raised by admitting air to a set of cylinders and are held against the wire by springs, which are in turn held under tension by the compressed air in the cylinders. The contact elements consist of easily renewable copper wearing strips. A hand pump supplies compressed air for raising the trolleys for initial operation when there is no air pressure on the locomotive.

The control current is provided by a dynamotor arranged to supply 750 volts for the low-voltage control circuits and lights. In conjunction with this dynamotor there are two air compressors designed for 750-volt operation, but doubly insulated. The middle point of the air compressor circuit is connected to the mid-voltage point of the dynamotor to insure equal division of the load between the two compressors. The two blower motors for ventilating the traction motors are also designed for 750 volts each and are doubly insulated.

In the engineer's cab the master controller is located on the left side of the cab to conform to the practice in Japan of running to the left instead of the right.

New Philippine Corporation

Among the new domestic corporations registered in the Philippines recently is the Manila Cordage Company whose capital of Pesos 1,000,000 is to be used in the growing and manufacture of hemp and other fibres. Captain H. L. Heath, for many years one of the most prominent hemp exporters, is one of the incorporators. The Lucban Electric Company incorporated for Pesos 100,000, will operate a light and power plant in the municipality whose name it bears. William T. Nolting, president of the Bank of the Philippine Islands, Leopold Kahn, N.E. Merchant, E. B. Ford and Gregorio Araneta are the incorporators.

Among the more prominent foreign firms who have registered in Manila recently are:—The Asano Cement Co., capital Y.35,750,000, Agent Takatomi Moriyama; The American Insurance Co., of New Jersey, Capital Pesos 6,000,000, Agent E. E. Elser, to do a fire and marine insurance business; The National Fire Insurance Co., of Connecticut, capital G.\$2,000,000, Agent E. E. Elser.

The Pipe Line and Workings at Gopeng Consolidated, Limited, in the F.M.S.

Paper Read Before the Engineering Association of Malaya By A. G. Glenister, A. Inst. M. M.

I SEE that I am down for a short paper on the pipe line and workings at Gopeng Consolidated, Ltd. The subject is, however, a very large one and so, thinking as I do that more or less complete details of the main pipe line and main workings are of greater interest to you than a sketchy description of the whole, I shall confine my remarks to a description of the Kampar water supply pipe line and the workings at the Lallang section.

The water supply of the mine is obtained from three pipe lines:—

1. The Kampar water supply which furnishes an average of 6,000 cubic feet per min., 4,000 cubic feet of which are used by Gopeng Consolidated, Ltd., and 2,000 by Kinta Tin Mines, Ltd.

2. The old Gopeng supply which furnishes an average of 600 cubic feet per min.

3. The new Gopeng supply which furnishes an average of 500 cubic feet per min.

The total water is divided almost equally between the Serdang and Lallang sections which are separated by the Gopeng-Kota Bharu Road.

The average monthly yardage treated by both sections is 120,000 cubic yards.

Kampar Water Supply—Pipe Line

DRAINAGE AREA.

The intake is on the Kampar River about $7\frac{1}{4}$ miles from Gopeng. The drainage area above the intake is covered by thick jungle and covers an area of approximately 39,400 acres at an elevation varying from about 900-ft. at the intake to 6,910-ft. on the watershed between Perak and Pahang. The sides of the mountains are steep and the general flow off is due west. The bedrock is granite with an overburden of clays and gravels.

FLOW-OFF.

The rains commence at the end of September or the beginning of October and from then onwards to about the end of June, the flow-off varies from 6,000 c.f.m. to large floods. Careful records were kept in 1912, and in that year the largest flood recorded was 25,000 c.f.m., while similar floods have been experienced since. It is possible that exceptional floods of three or four times that amount occur at long intervals. During the months of July, August, and the first part of September the flow-off, under normal conditions, is less than 6,000 c.f.m. The lowest recorded flow in the year 1912 was 2,700 c.f.m. (September 18th) but it may be regarded that 6,000 c.f.m. is the average supply.

The average flow-offs for the dry months of 1912 were:—

June	7,000 c.f.m.
July	4,900 c.f.m.
August	3,600 c.f.m.
September (dry part)	3,000 c.f.m.

It should be noted that the above observations are very general so far as distribution of flow-off is concerned and there may be exceptional dry periods during any month of the wet season when the flow-off will be less than the average limits. I would mention that the total rainfall for the year ended September 30, 1921 was 95.54-in. at the intake and 91.79-in. at the mine.

INTAKE WORKS.

The intake works consist of a concrete dam built across the river bed and founded on the solid granite, with an overflow 155-ft. in length to provide for exceptional floods. The dam is 45-ft. high at its highest point measured to crest of overflow at the highest, and the average height is about 30-ft. The supply to the pipe line passes through iron gratings, which are provided to keep back floating logs, into the settling basins. Through these basins the

water has a velocity of one foot per second. Experiment has shown that even if the finer sediment deposited on the floor of the settling basin were to enter the pipe line such sediment would not have any appreciable effect on the metal. From the settling basins the supply overflows into the outlet chamber and the water enters the pipe through a bellmouth.

PIPE LINE.

The pipe line is 45-in. diameter through, and is designed to convey 6,000 c.f.m. to the mines at Gopeng, giving a working pressure of 150-lb. per sq. inch.

Diameter of pipe	... ..	45-in.
Area of pipe	... ..	11.04 sq. ft.
Length of pipe line	... ..	41,018-ft. i.e. 7.77 miles (hor)
Velocity of water in pipe	... ..	9-ft. per second.
Quantity flowing	... ..	100 cu. ft. per second.
Total head from Intake to No. 2 Meter House	... ..	612-ft.
Total head from Intake to the Kampar Road	... ..	640-ft.
Head lost in friction	... ..	266-ft.
Available head at mine	... ..	346-ft =
Hydraulic gradient	... ..	1 in 154.
Brake horse power developed	... ..	3,300 approx.

The pipes were constructed by the Mephan Ferguson Lock Bar Pipe Co., Ltd. The plates for the barrel were rolled in two semi-circles and joined by the Company's patent lock bar, while the joints between successive lengths of pipe were of the butt variety.

The two barrels are linked up with a small clearance ($\frac{1}{2}$ -in. to 1-in.) between each by a butt strap rivetted on to each barrel by a single row of rivets. These straps are 6-in. broad, and are made in two halves; as they lie almost flush with the locking bar which prevents a complete circling of the barrel by the straps, two cover plates, covering both the locking bar and the ends of the straps, are rivetted on to complete the joint.

The standard length for pipes is 28-ft. Special expansion joints with tallow packed glands are placed at distances not exceeding 500-ft. All angles up to 5 degrees are taken up at expansion joints, and angles above this figure were made in special steel castings provided with holding down bolts. These castings were made to four patterns, viz:—10°, 15°, 20° and 25°, with expansion joints for connecting up with spigot ends of steel pipe on either side. (The bends are bolted down to large blocks of concrete varying from 10 to 80 tons according to the thrust to which they are subjected).

Air valves are fixed at the summits, and scour valves at all depressions; the former are 4-in. diameter and the latter 10-in. diameter. As stated, expansion joints are provided to take up variations due to temperature changes at lengths not exceeding 500-ft., and for this length the following are the increments for different variations in temperature:—

Variation in Temperature.	Variations in length.
90° Fahr.	3 $\frac{5}{8}$ inches
80° "	3 $\frac{7}{32}$ "
70° "	2 $\frac{13}{16}$ "
60° "	2 $\frac{13}{32}$ "

The following table gives the number of pipes and joints for each thickness of pipe employed.

Thickness of Pipe.	Maximum Static Head.	Number of different pipe lengths.	Number of Bends.	Butt Strap.	NUMBER OF JOINTS. Expan- sions on S. Pipes.	Expan- sions on Bends.	Total Number of Joints.
5/16 in.	419 ft.	794	20	710	48	40	798
3/8 in.	562 ft.	103	2	94	7	4	105
7/16 in.	650 ft.	599	6	558	35	12	605
Totals	...	1,496	28	1,362	90	56	1,508

* Not all standard length, and includes "closure" pipes.

THE PIPE LINE AND WORKINGS AT GOPENG, CONSOLIDATED, F.M.S.

May, 1924

THE FAR EASTERN REVIEW



Thirty-inch Pipe Line



Forty inch Pipe Line



Malay Girls Washing Tin in Sluice Boxes at Gopeng



Hydraulic Elevators at Gopeng

SUPPORT FOR PIPE LINE.

The pipe line is all laid above ground and is supported on concrete pillars. These are founded on rock, hard earth or on piling. Usually the spacing of piers is 28-ft. apart, but where the nature of the foundation requires it, the intensity of the load is reduced by spacing the piers 14-ft., also by increasing the area of the footings. All piling was driven till a set of $\frac{3}{8}$ -in. with a 5-ft. drop of the monkey was reached. The weight of the monkey for 8-in. by 8-in. and 6-in. by 6-in. piles was 400-lbs., and for 9-in. by 9-in. piles 1,120-lb. The piling was all of chengai or merbau wood.

It may be noted that during construction the empty rivetted pipe was left unsupported at one place for a length of 84-ft. without any springing of the caulking taking place. To carry the pipe line and tramway during construction over the Kampar River, three lattice bridges of 80-ft. and one of 55-ft. span were constructed. To bridge small ravines and uneven ground 37 lengths of trestle-work were erected. The latter varied in length from 14-ft. to 322-ft., and in height from 5-ft. to 30-ft. All bridges and trestlework are of steel.

RIVETTING OF PIPES.

The bottom semi-circle of rivetted joint was completed first by hand, the rivets being hammered up inside and held up from outside the pipe; the rivets in the top semi-circle were put in from inside and hammered up on the outside of the pipe. Some of these latter rivets were hammered up with pneumatic hammer, but the majority were done by hand. The cover plates were rivetted up by hand, the hammering being done on the outside. All caulking of the butt straps and cover plates was done with the pneumatic hammer. Great difficulty was experienced in getting sufficient labour to work the pneumatic hammers, the work being too heavy for the Chinese artisans. A few joints were caulked by hand but the work was most inferior compared with that done by the pneumatic hammer.

METHOD OF TRANSPORT.

All material from Penang was brought by rail to Kota Bharu, whence the transport of pipes to Gopeng was carried out by traction engines, and latterly by bullock wagons, the latter method proving the cheaper. All other material was transported by bullocks. On the works a tramline, 2-ft. gauge, was laid alongside of the pipes. Along three miles of this track the haulage of material was done by steam locomotives, whilst over the jungle section four miles were worked by steam winches (three in number) and a locomotive. The remaining mile towards the intake works was worked by coolie haulage. Special bogey trucks were used for the transport of pipes.

TIME OF CONSTRUCTION.

The trial surveys were completed in the year 1911, and the earthworks were cut in 1912. The first pipes were delivered in Malaya in June 1913 and the pipe line was completed in February 1915.

GEOLOGY.

Many different theories have been advanced to account for the Gopen deposits and I will not weary you with them now, but I will say that in my opinion the evidence available at the mine tends to confirm the theory propounded by Dr. W. R. Jones. This, briefly put, is as follows:—The Gopeng deposits are not true alluvial deposits but have resulted from the decomposition in situ of schists and phyllites which have subsequently subsided into very large troughs due to the solution of the underlying limestones by water percolating from above. When the neighbouring granite mass of the main range was intruded it sent off numerous small stringers carrying tin-ore into these schists and phyllites, forming a kind of stock-work.

These metamorphosed rocks have since been subjected to a long period of intense tropical weathering and have subsided into the large limestone cups mentioned above. During this process the original form of the deposit has been lost, the stringers have been broken up into angular fragments, and the tin-ore has become distributed; the result being a deposit containing tin-ore throughout but richer near the granite junctions.

That the percolating water has been largely instrumental in decomposing the less stable minerals originally associated with the cassiterite is strongly evidenced by the frequent occurrence of an iron-oxide cap resting on the limestone. I will now pass on to the workings at the Lallang section.

Lallang Section—Main Paddock

PLANT.

Three "O & C" type elevators fitted with 3-in. diameter nozzles with a pressure at the base of 170-lbs. per sq. in. The vertical lift is 76-ft. Kampar water supply—3 monitors fitted with 2-in. dia. nozzles at a pressure of 150-lb. per sq. in. Old and new Gopeng water supply—3 monitors fitted with 2-in. dia. nozzles at pressure of 60-lbs. per sq. in. The ratio of cutting water to elevator is approx: 0.7 to 1.

FEEDER AND SLUICE BOXES.

The feeder is 156-ft. long, 10-ft. wide, and built with a gradient of 1:60. At the head of the feeder a "Grizzley" is employed for separating all material over $\frac{1}{2}$ -in. size. This is returned to the paddock for a second and final treatment.

BOXES.

These are 300-ft. long, with a gradient of 1:50 and divided into 4 boxes each 7-ft. 6-in. wide and two boxes each 10-ft. wide, giving a total width of 50 feet.

EXCESS WATER.

Excess water is led off the feeder and discharged without passing over the material in the boxes leaving 35 cubic feet of water and material to one transverse foot of sluice box. The tailings from this section are discharged into the Sanglop valley and held up by Sanglop Dams No. 1, 2 and 3.

TAILINGS DAM, ETC.

Three tailings dams have been built in the Sanglop valley and one on the Serdang section. Sanglop No. 1 was built in 1914. It is 16 chains long. There are two concrete spillways, 56.5-ft. and 51-ft. wide respectively, one for general use, the other for flood water. The area impounded by this dam is 208 acres.

Sanglop No. 2 was built in 1916/17 and came into operation in August 1917. It is 31 chains long, 10-ft. wide on the top and 80-ft. wide at the base. On the upstream side the dam has a slope of 1:3 and on the downstream side a slope of 1:2. This dam contains a puddled clay core. The overflow of the box spillway is 128-ft. long with four outlet tunnels all 100-ft. long and 9.5-ft. wide designed to take off 100,000 cubic feet per minute. The area impounded by this dam is 239 acres.

Sanglop No. 3. The construction of this dam was commenced in August 1920 and it became operative in December 1920. There are two concrete spillways each 50-ft. wide. The dam is 18 chains long, 80-ft. wide at the base, and 10-ft. at the top. The clay core is two feet wide at the top, two feet below the surface of the dam and between 5-ft. and 6-ft. wide at the base. The slopes of the dam are 1:3 upstream and 1:2 downstream. This dam impounds an area of 165 acres. The top of the dam was built 13-ft. above the level of the slimes in August 1920.

Sludge Channels

SANGLOP CHANNEL.

From Sanglop Dam No. 2 the sludge is directed along the bed of what was formerly the Sungei Sanglop for a distance of about 4 miles until it reaches a railway bridge on the north side of Kota Bharu station. From the railway bridge to the Kinta River (a distance of 180 chains) a channel has been excavated 25-ft. wide.

TEJA SLUDGE CHANNEL.

From Serdang the sludge here is also directed along the old river bed for a distance of approx. 5 miles until it reaches a railway bridge on the south side of the Kota Bharu railway station. From the bridge to the junction of the Sanglop Channel and the Kinta River (a distance of 74 chains) a channel has been cut 25-ft. wide.

In order to give you some idea of the problems which these channels have solved, I will give you a brief history of the Sanglop valley during the last thirty years.

Before the original Gopeng and Kinta mines were brought into being, Asiatic miners had been dumping into the Sanglop valley for years. When the European companies began operations the scale of dumping was very materially increased not only by the Companies' own activities but also by those of the Asiatics who profited by the additional water introduced into the upper part of the valley by the pipe lines.

(Continued on page 230)

Pengkalan, Ltd., Power Station and Electric Dredge

Paper Read Before the Engineering Association of Malaya, By W.J. Wayte, M.I.E.E.

I PROPOSE as the subject of this paper to give a short description of the power plant on this property and describe any of the machines which I think may be of interest to the members of this association.

The original power plant consisted of three water-tube boilers and two triple-expansion high-speed engines and alternators, each of 500 k.w. capacity, which supplied power to drive three suction gravel pumps, and monitor pumps. The gravel pumps were erected on pontoons and worked in a dry pad-dock, the ground being cut by moni-tors.

On the outbreak of war and the collapse of the tin market, the dredges were closed down and dismantled, and the power station has since been used to supply power to neighboring mines and for the company's mining operations which have been on a small scale up to the present time.

A bucket dredge, of which a description is given later, is now approaching completion and will be driven entirely electrically. The company has entered into an agreement with government to supply 350 k.w. for power and lighting to the township of Ipoh, and it is hoped that the work will be completed by the end of the year.

The present power plant is as follows:

Four water-tube boilers, each of 2,437 square feet heating surface, with chain grate stokers and superheaters; the working pressure is 175-lb. per sq. in. and temperature of the superheated steam 500° F.

The coal used is "Smalls" from the Malayan Colliery Co.'s mine, which burns satisfactorily on the chain grate stokers.

One 600 k.w. turbo-generator. The turbine is of the Rateau mixed pressure type, running at 3,000 revolutions per minute, and is direct coupled to a 600 k.w. three-phase, 50 period, alternator, generating current at 2,200 volts pressure. This machine was installed in 1912.

No. 2 machine is one of the original triple-expansion engines, the other having been sold to make way for the new turbo-generator which I will now describe.

This machine was completed in Novem-

ber 1920, it is of 1,200 k.w. capacity and runs at 3,000 revolutions per minute. A few details of its construction may be of interest. The turbine is of the Rateau impulse multi-stage type. The first wheel is a velocity wheel with two rows of blades and the remaining six wheels each have a single row of blades.

The wheels are of solid steel turned all over; the blades are milled from solid bars, and machined with a fork to fit astride the wheel, to which they are secured with countersunk rivets.

The diaphragms are of cast iron made in halves, the blades being cast in position.

No drop in pressure takes place except through the diaphragm blading. The clearances can therefore be large; the axial clearance between wheels and fixed parts is about $\frac{3}{32}$ -in., and the radial clearance about $\frac{1}{4}$ -in.

To prevent leakage of steam at the centre of the diaphragms, glands made of soft brass are

provided. These are machined to a knife edge and practically touch the rotor. The glands at the h.p. and exhaust end of the casing are of similar design and consist of steel boxes in halves. These boxes are provided with rings machined to a sharp edge which are a very close fit to a steel sleeve fitted on the rotor shaft, on which are machined other rings fitting between the box rings, and forming a labyrinth packing. The L.P. packing is always sealed with steam to prevent loss of vacuum and the H. P. end is sealed by internal pressure when the machine is on load. No lubrication is required. The governing of the machine is controlled entirely from oil pressure, and a combined stop and emergency valve comes into operation if the speed exceeds 10 per cent. above normal.

The thrust bearing is of the "Michell" type.

The alternator is of the standard turbo type and direct coupled to the turbine. It is designed for an output of 1,500 k.v.a., three phase, 50 periods, 2,200 volts.

The insulation of the stator is of mica moulded on to the former wound coils. The end connections are very strongly clamped to prevent distortion by short circuits. The exciter is of the overhung type, mounted



Electrically Operated Tin Dredge at the Pengkalan Mines, F.M.S.



Washing Tin in Sluice Boxes of Tin Dredge

on the extension of the alternator shaft, and is designed for a pressure of 110 volts.

The condenser is of the surface type, 300 sq. ft. cooling surface, with Edwards air pump, and is designed to maintain a vacuum of 27½-in. at full load. The cooling water required at 90° F. inlet temperature is 2,200 gallons per minute.

On the right of the main switchboard will be noticed the new switch cubicle for controlling the supply to Ipoh.

Bucket Dredge.

The pontoon is 160-ft. long, and 43-ft. wide, 9-ft. deep aft and 8-ft. deep forward. It was built on shore and launched on slipways with the gantry posts in position.

The pontoon is provided with 14 water-tight compartments, each of which is connected to the bilge pump, mounted on the deck.

The ladder is 106-ft. long to the centre of the tumblers. It is close framed, with diagonal stays and tray plates. The ladder rollers are of cast steel with rocker chair bearers.

101 manganese steel buckets are used, of 5 cu. ft. capacity, close connected. The bucket pins are of nickel chrome steel.

The upper tumbler is of cast steel five sided, and fitted with manganese steel wearing plates.

The lower tumbler is circular and of cast steel.

The tables are divided into two banks. The top tables are divided into eight partitions each 3-9½-in. wide and 100-ft. long. The bottom tables are about 30-ft. shorter.

The total table area is approximately 5,500 square feet.

All machinery requiring speed variation is controlled from a platform on the starboard side, forward, 12-ft. above deck level.

The dredge is designed to dig 80,000 cubic yards per month at a depth of 45-ft.

The following particulars of the power equipment may be of interest:—

The dredge is connected to the transmission line on the shore by a 200 volt, three core, armoured cable, particulars of which are as follows:

The cores consist of No. 2 B & S. stranded copper, insulated with rubber tape and varnished cambric. The conductors are stranded together with jute fillers, taped, covered with a layer of tarred jute, armored with No. 12 b.w.g. galvanized steel wires, with protective braiding over the armoring.

The dimensions of the cable are:

Over protective braiding	1.85-in.
Over armor	1.4 "
Under armor	1.27 "

The slack of the cable in the dredge pond is carried by floats, and a cable winch is mounted on the dredge. This cable leads to a high-tension switch cubicle, fitted with the necessary recording instruments, which controls a bank of three single-phase transformers forming a group of 400 k.v.a. capacity. The ratio of the transformers is 2,000/400 volts.

To provide water for the upper and lower tiers of tables two pumps of the centrifugal type are provided, each capable of delivering 400 gallons of water per minute against a head of 22-ft. and 15-ft. respectively. These two pumps are driven by a 75 h.p. squirrel cage motor.

The screen pump is of the same type and designed to deliver 300 gallons of water per minute against a head of 40-ft. This pump is driven by an 85 h.p. synchronous motor which I shall refer to later.

The bucket line motor is 120 h.p. and the screen 35 h.p., the motor for the ladder winch is 50 h.p. and for the mooring winch 25 h.p.

All the motors are controlled by switchgear of the iron-clad type and are fitted with no-volt and overload release. The only motor calling for special mention is the 85 h.p. motor driving the screen pressure pump. This motor is of the self-starting synchronous type and embodies some special features.

The rotor is wound with a symmetrical two-phase winding. Three slip-rings are used, the middle ring being connected through the exciter to the mid-point of the two-phase winding. The rotor current on starting passes through the exciter but when the exciter builds up the continuous current generated is superimposed on the alternating rotor current and the rotor pulls into synchronism.

The starting of the motor for a machine of this type is exceptionally simple, the motor runs up to speed quickly, taking rather

less than full load current momentarily, and pulls into synchronism immediately full speed is reached. A switch is connected in one phase of the rotor which is opened after synchronism has taken place, the rotor current being reduced from 170 to 118 amperes.

This machine has been installed with a view to correcting the station power factor and it is hoped that much benefit will be obtained from it.

Pipeline and Workings at Gopeng

(Continued from page 228)

As a natural consequence the upper Sanglop valley became gradually filled with tailings which, as little attempt was made to impound them, were moved downstream a little at a time after each rainstorm. They spread over the valley bottom and the levels rose until slimes began to invade the lower lying agricultural holdings. In 1915 Sanglop Dam No. 1 was built to retain the tailings from the Gopeng Consolidated and Kinta Tin Mines and 4,000 cubic feet of water per min. were introduced into the valley from the Kampar water supply. The Sanglop Dam No. 1 retained the new tailings but the old tailings and new tailings from Asiatic miners operating below the dam were gradually forced down the valley until they were held up by the embankment of the railway.

Various expedients were tried to deal with the situation created and in 1916 Sanglop Dam No. 1 being full, Sanglop No. 2 was constructed.

The government became apprehensive as to the safety of the railway and complaints were received from land owners of the lower part of the valley that the silt was rising and flooding their land. Early in 1917 various high government officials met Messrs. Osborne and Chappel and after discussion it was agreed that the railway should alter their bridge and culvert accommodation to deal with flood water and Messrs. Osborne and Chappel should clean and straighten the channel of the Sanglop River from the Kinta River up to the railway bridge. There was a certain amount of delay in obtaining the necessary authorisation and work was not commenced on the cleaning out of the Sanglop channel until September 1917.

Progress was at first very slow, the coolies finding it very difficult to work in the deep slimes and, for a short time, it was feared that the scheme could not be carried through. Eventually, however, the work was completed and an immediate improvement was noticed. Surveys had showed a grade of 4½-ft. per mile to be available over the 2½ miles of channel, giving a mean flow of 3.35 feet per sec. i.e. enough to carry off a considerable amount of solids in suspension. A channel 15-ft. wide, following the old river bed as far as possible, but straightening out all prominent bends and curves was put through and later widened out to a size experience showed to be necessary after a scour had been induced.

By early 1918 the stream had been forced into a defined channel and the surface of the water in dry weather was well below the level of the silt floor of the valley. Conditions since then have steadily improved and to-day we have a well defined channel from the outlet of Sanglop Dam No. 2 to the Kinta River, which careful records and surveys made during the last nine months have proved can carry well over 2,000 grains of slimes to the gallon without silting the channel.

Saw Mill for Changchun

The Yalu Timber Company is planning the erection of a new mill of considerable capacity at Changchun which will extend its service zone almost 100 miles westward of the Kirin district where it put a branch mill in operation some time ago. The timber company, which is capitalised for \$3,000,000, is a Sino-Japanese organisation, is the outgrowth of the timber industry started in 1904 by Baron Okura at Yongampho on the Korean side of the Yalu. The area of timberland held under concession by the company is said to contain more than 3,500 million cubic feet of lumber, beside which the company has the exclusive right to purchase and market logs cut by the natives from lands adjacent to its concession area. The company's main mill is located at Antung.



Model of Taikoo Dockyard made for the British Empire Exhibition.

Hongkong's Contribution to the Empire

Taikoo and the Hongkong & Whampoa Docks

ONE of the most interesting exhibits of the Hongkong section at the British empire exhibition is that of the Taikoo Dockyard and Engineering Company of Hongkong, Ltd., which prepared an exact facsimile of the entire dockyard made carefully to scale showing in

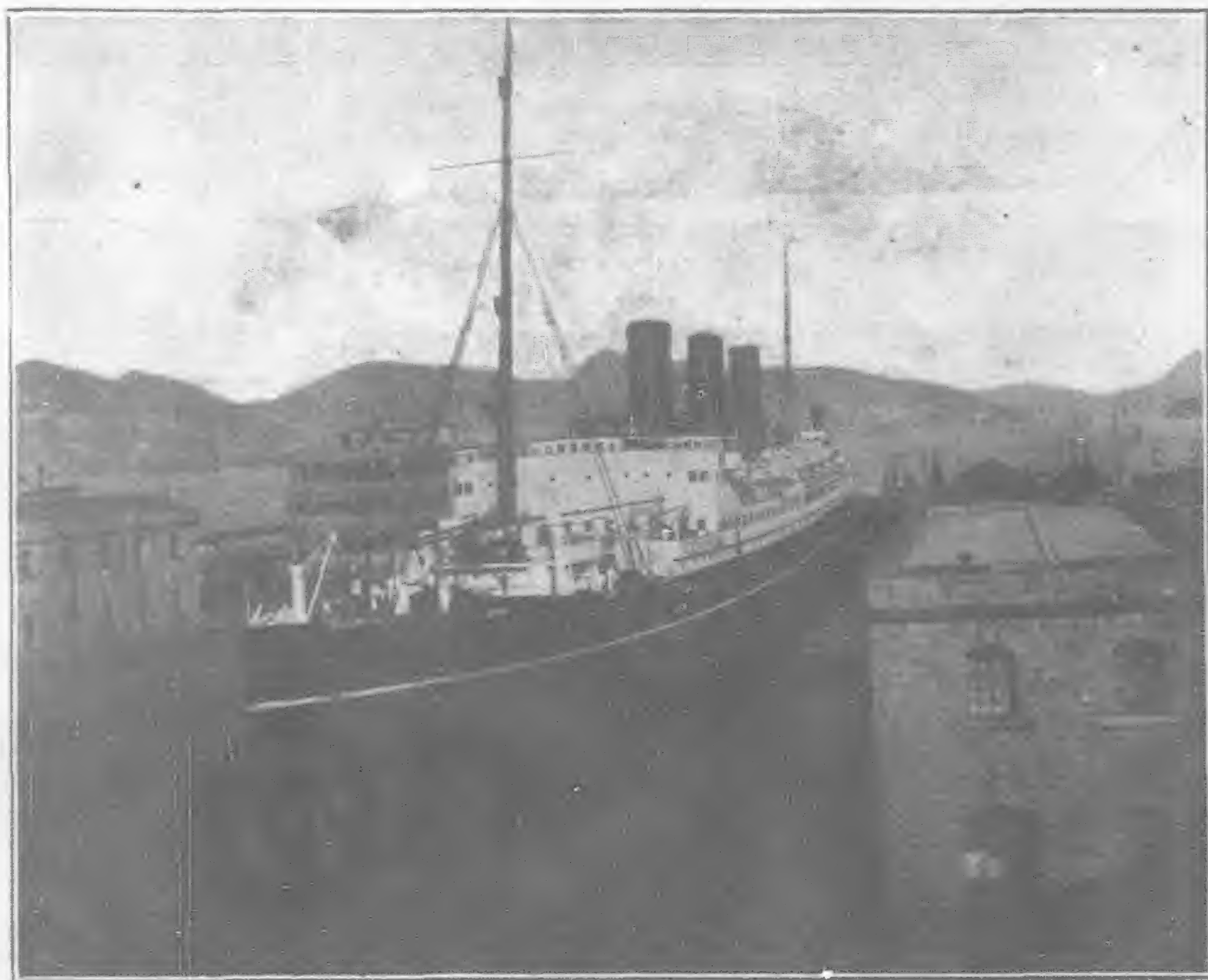
detail every building, slipway and road on the company's property. This model was executed at the company's works and occupies a prominent place in the exhibits of the colony, giving the visitor to the Wembley exhibition a lively visual idea of the magnitude of the dockyard with its quay wall 3,200 feet in length. Two ocean-going steamers and several other craft moored alongside the quay wall in the model testify to the varied activities of the dock in the repair and building of ships.

Advantage was taken by the dock to include in the model the Canadian Pacific liner *Empress of Canada* as it lay in the drydock in a recent overhauling given the vessel in Hongkong. In the small model, the liner is seen directly behind

the administration building. A separate illustration shows the *Empress of Canada* after the dock had been pumped out. This dock, one of the largest in the Orient, was constructed to British admiralty requirements and is 787 feet long by 81 feet 10 inches wide at the bottom. The total length on the blocks is 750 feet.

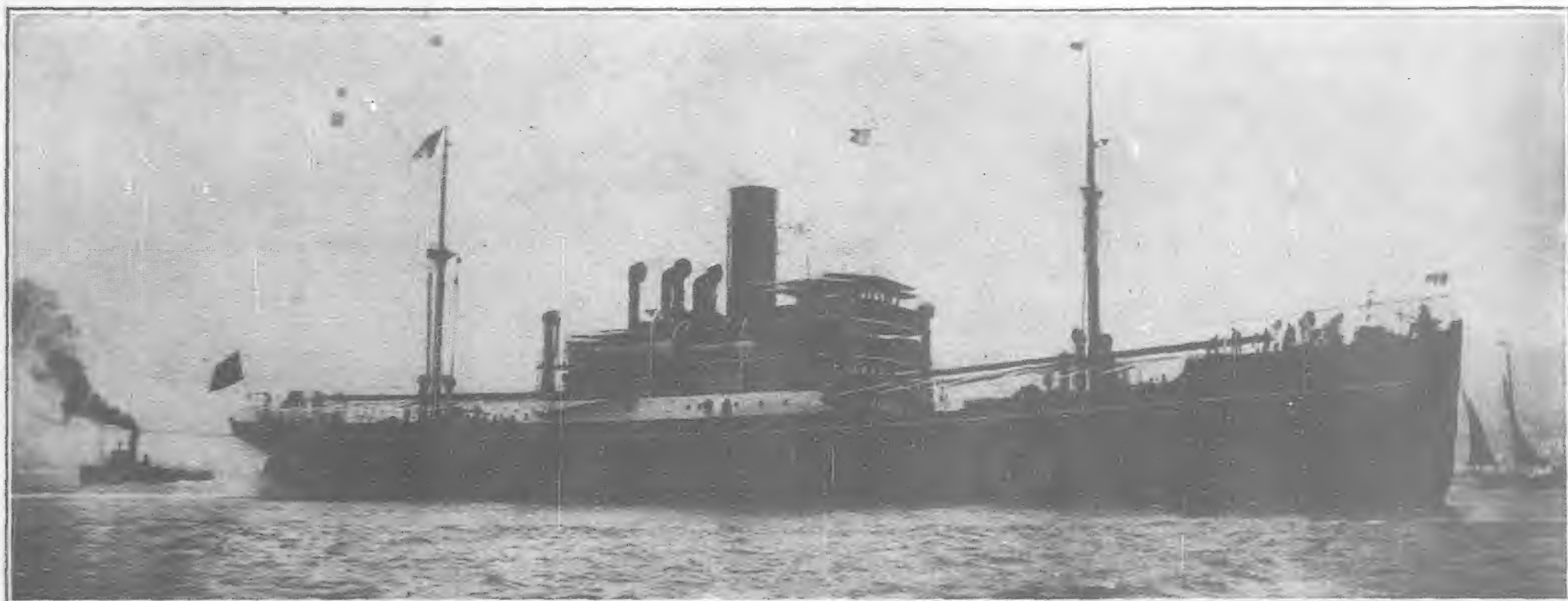
This dock is extremely rapid in operation as it can be filled in 45 minutes and its pumps have a capacity for emptying it, even with no ship on the blocks, in less than

four hours. The depth of water to be handled is 34 feet 6 inches. The dock is equipped with railway tracks on both sides to carry the traveling cranes which have a capacity up to 20 tons. Aside from the big dock, the yard has three slipways capable of handling steamers up to 3,000 tons which can be hauled up the ways in 45 minutes. The motive power for the dockyard consists of 3,000 horse-power gas engines driving electrical generators, and taking their power from four gas producers.

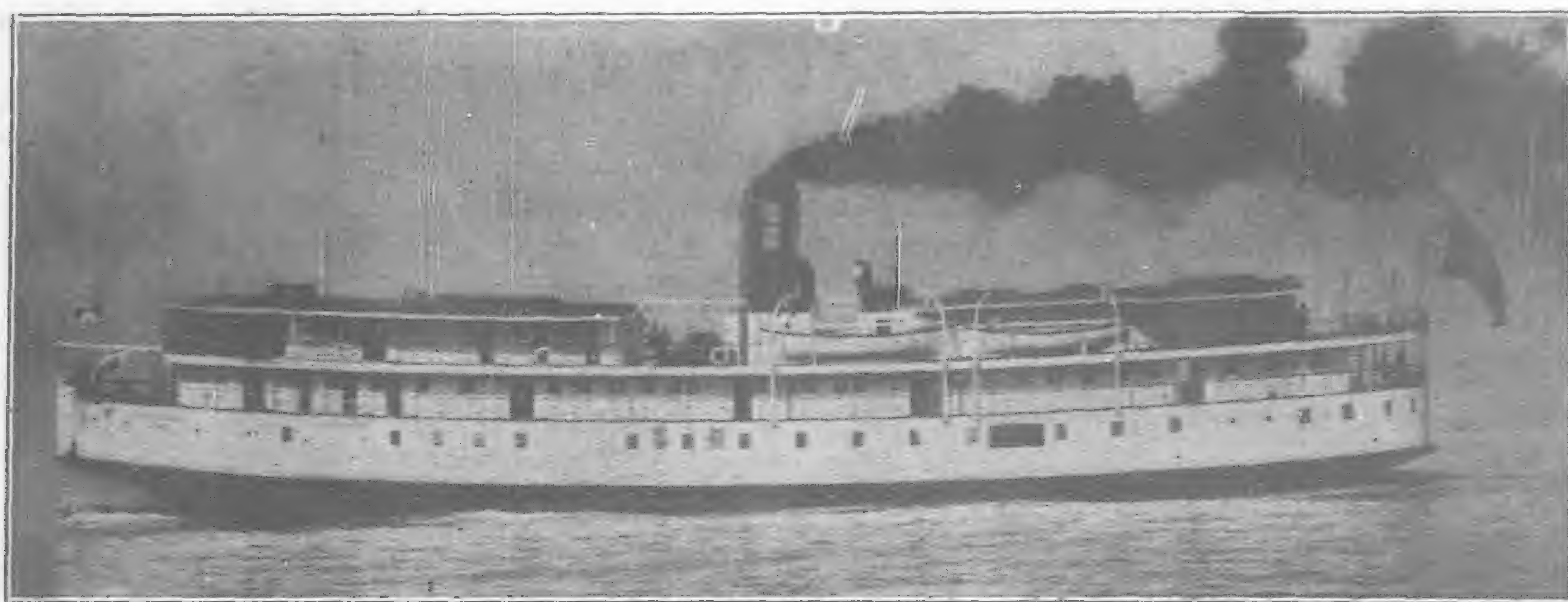


"Empress of Canada" in Taikoo Dock

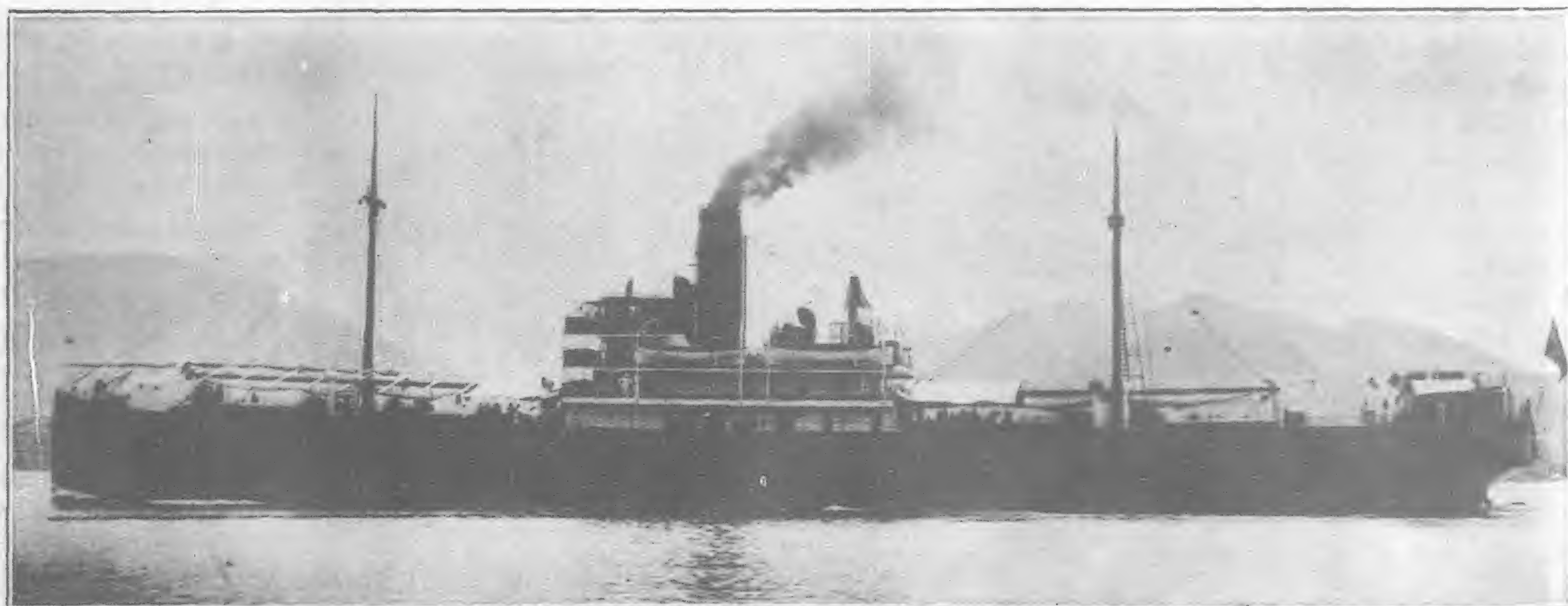
New Steamers Recently Launched from the Taikoo Dockyard



S.S. "Nanning," Built at Taikoo Dockyard



River Steamer "Hang Cheong"



Yangtze River Steamer "Wenchow"

The Growth of a Great Shipbuilding Industry

The Hongkong and Whampoa Dock Co., Ltd.

BEFORE Hongkong became a British colony, there were mud docks at Whampoa in the Canton River. They were owned by Chinese, and the P. & O. Co., not caring to entrust the docking and repairing of their coast steamers to Chinese without European supervision, sent Mr. John Couper (then a carpenter

in their service) to Whampoa as their representative to look after interests when their vessels went into dock. Mr. Couper speedily realized the requirements of the shipping trade, and set about a plan of campaign which brought immense prosperity to the colony. The docking business was a lucrative one, so his first step was to lease the Whampoa Mud Docks from their Chinese owners. Out of his large profits he built the Couper Dock at Whampoa, and was conducting a prosperous business when the "Arrow" lorcha affair brought about war between Great Britain and China, and involved the Whampoa Docks in temporary eclipse. The Chinese set about the destruction of the Couper Dock, which was built of granite. The stones on some of the side altars were torn asunder and cast down into the bottom of the dock, and the machinery and working plant more or less destroyed by the Chinese troops. Mr. Couper himself was kidnapped, and his fate was never known. Peace and indemnities followed, and Mr. Couper's son was awarded about \$120,000 as compensation. The dock was pumped out, and the Chinese who had been so eager to destroy were employed to replace the granite masonry. In about two or three months, all the masonry had been relaid, and the docking establishment was soon under way again.

On July 1, 1863, the present designation of this Company was assumed. Under a deed of settlement, Mr. (later Sir) Thomas Sutherland, then agent for the P. & O. Co. in Hongkong, was appointed chairman, and Mr. Douglas Lapraik of the Douglas Steamship Co., secretary. They took over the Couper Dock and the Lockson Dock at Whampoa from Mr. J. C. Couper on behalf of the company for the sum of \$140,000, and the stock of these establishments for about \$35,000.

In 1865, the company concluded negotiations with Mr. John Lamont for the purchase of his property at Aberdeen, comprising the Lamont Dock then in working order, and the Hope Dock then in course of construction, together with the workshops, machines, etc.

On October 11, 1866, the Hongkong and Whampoa Dock Co., Ltd., was registered under the companies ordinance, to take over the

affairs of the original company with a share capital of \$750,000, and Mr. James Whittall of Messrs. Jardine, Matheson & Co., was the first chairman.

The Hope Dock was opened in June, 1867, by the then governor of Hongkong, Sir R. G. MacDonnell, and for a number of years was largely used for docking ships of her majesty's navy and other large vessels.

In March, 1870, an amalgamation was made with the Union Dock Co. which possessed the property at Kowloon on which the present Nos. 2 and 3 docks are situated, and the capital of the company was increased to \$1,000,000.

Mr. David Gillies was appointed secretary and manager in November, 1875.

In January, 1877, the properties at Whampoa, not being found to be remunerative, were sold to the Chinese government on the condition that no vessel of any other nationality than Chinese should be docked there.

The two patent slips belonging to Captain Sands were purchased in August, 1877, for \$150,000, and were subsequently removed to Kowloon Docks where they are still doing good work.

In December, 1880, the company purchased from the Cosmopolitan Dock Co. the whole of the property, plant, etc., including the goodwill of that company for \$400,000,

the stock-in-trade and steam launches being taken over at a valuation. The capital of the Dock Company was then raised to \$1,250,000. In the same year a difficulty arose owing to low tides in placing H.M.S. *Audacious* in the Hope Dock, and as the British admiralty were contemplating the necessity of sending out a larger class of vessel to the China station, the commander-in-chief, Admiral Willes, was instructed to see what could be done to provide increased facilities for docking the largest vessels of her majesty's

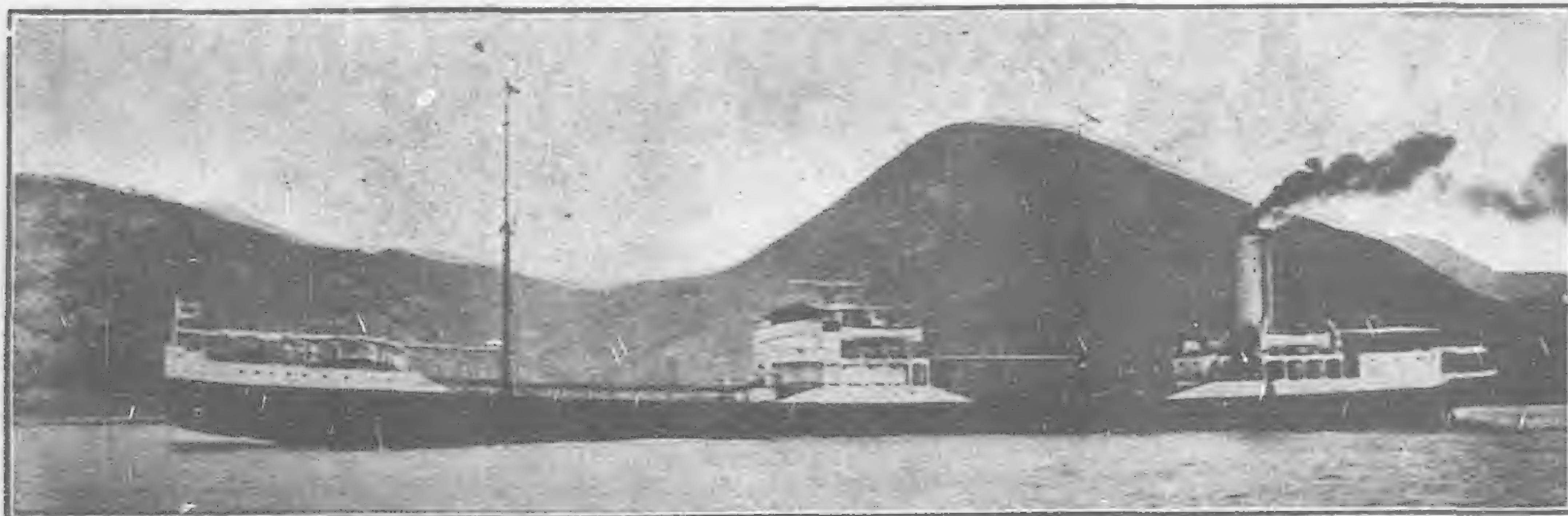


No. 1 Dock, Saw Mill and New Building Berths

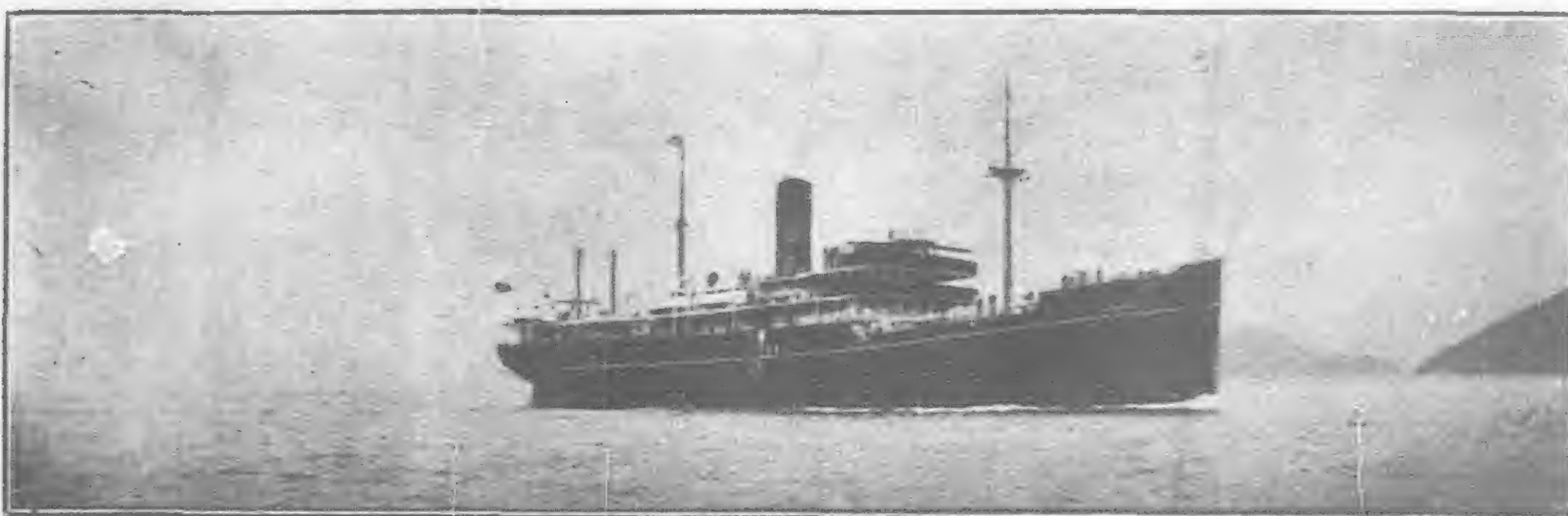


Staff Quarters at Kowloon

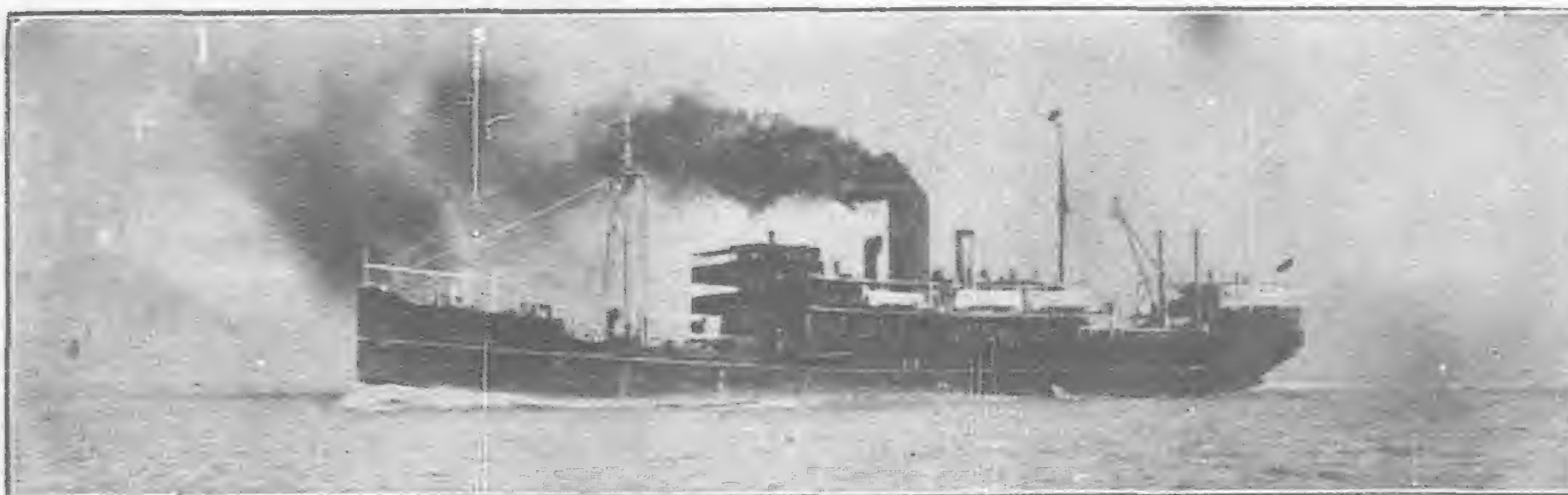
Some Recent Steamships Built by Hongkong & Whampoa Dock Co., Ltd.



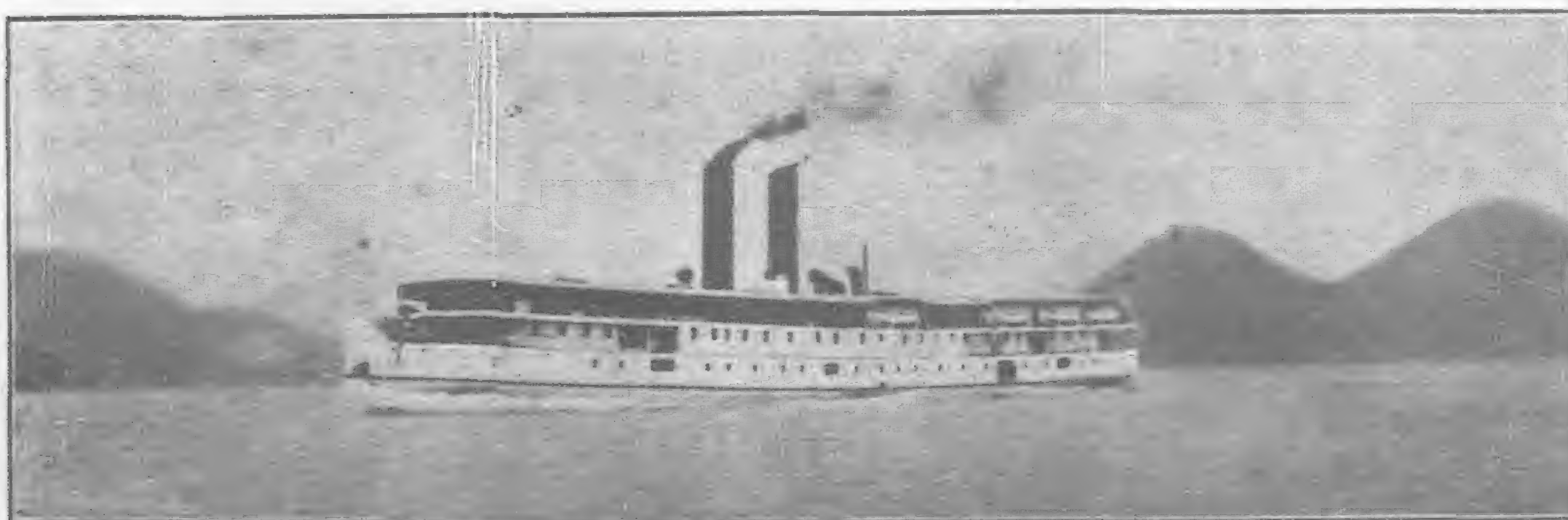
S.S. Paludina, One of Four Oil Tankers Built to the Order of the Anglo-Saxon Petroleum Co., Ltd.
Dimensions 412-ft. by 53-ft. 1-in. by 31-ft. Mld.



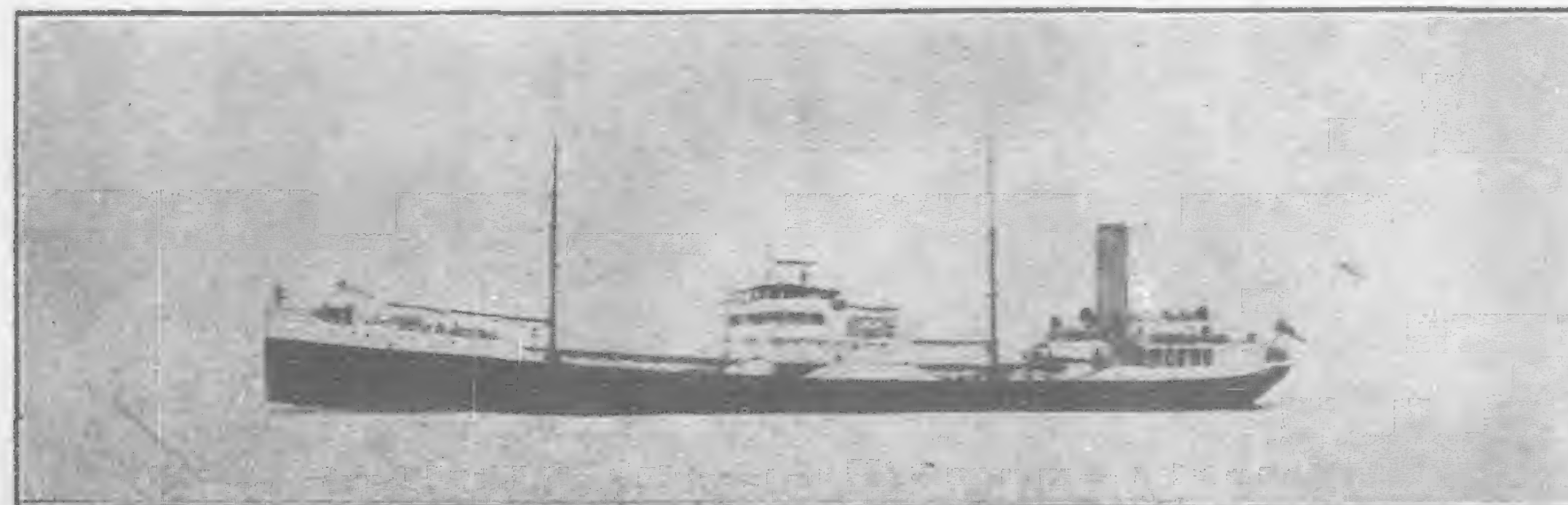
S.S. Yuen Sang. Dimensions 310-ft. B.P. by 46-ft. by 25-ft. Mld.



S.S. Suisang, Sister Ship to the *Yuen Sang*.



River Steamer Lungshan. Dimensions 290-ft. B.P. by 45-ft. by 13-ft. 6-in at Deck.



S.S. Planorbis, Sister Ship to the Tanker *Paludina*.

navy. The result was that in 1882, construction of the present No. 1 dock at Kowloon was started and was completed in 1888. It cost over \$1,000,000 of which £25,000 was granted by the British government in return for priority of entrance for 20 years. It was considered at that time, second to none in any part of the world for design, finish and facilities for docking.

In 1886 the capital of the company was increased to \$1,562,500 divided into 12,500 shares of \$125 each fully paid. The capital of the company was again raised in 1901 to \$2,500,000, divided into 50,000 shares of \$50 each fully paid.

The retirement of Mr. David Gillies took place in 1901 after 26 years of splendid service, during which period he was very largely instrumental in successfully piloting the company through very difficult times to the highly prosperous condition it was in on his retirement. His successor, Mr. W. Dixon, held the post for three years, followed by Mr. Wilson and Mr. Robert Mitchell who acted as chief manager until the former retired in 1909.

The present chief manager—Mr. R. M. Dyer, B.Sc., M.I.N.A., took charge of the company's affairs after the retirement of Mr. Wilson, and it is from this period to the present time that a very progressive policy was introduced and maintained, bringing the company into the first rank of shipbuilding, engineering and repairing establishments to be found in any part of the world.

In 1915 the capital was increased to \$3,000,000 by the issue of 50,000 shares of \$10 each, and at the same time, debentures of 6 per cent. were issued to the extent of \$1,000,000.

In common with many other places in the empire, Hongkong was given its greatest task during the period of the war. It was then that this establishment was able to show what really could be done in the way of shipbuilding, engineering, converting, reconditioning and repairing.

From this date onwards the business of the company considerably increased. New land was purchased from the government, and three building berths were put down, and a new shipbuilding yard built on the east of the old yard. The plant was extensively overhauled, and at the present time, the yard is complete with all modern shipbuilding machines, the company being capable of turning out steamers of 800-ft. and over. It was from this yard that three of four large oil tankers (each 8,400 tons) were launched in 1921, these being to the order of the Anglo-Saxon Petroleum Co., Ltd. A year or two previous to this, the west yard was fully employed, and as many as eight ships, side by side, could be seen under various stages of construction.

The policy of progress and expansion is fully evident at this present moment, when the company is spend-

WORKS OF THE HONGKONG & WHAMPOA DOCK COMPANY, LIMITED, AT KOWLOON

May, 1924

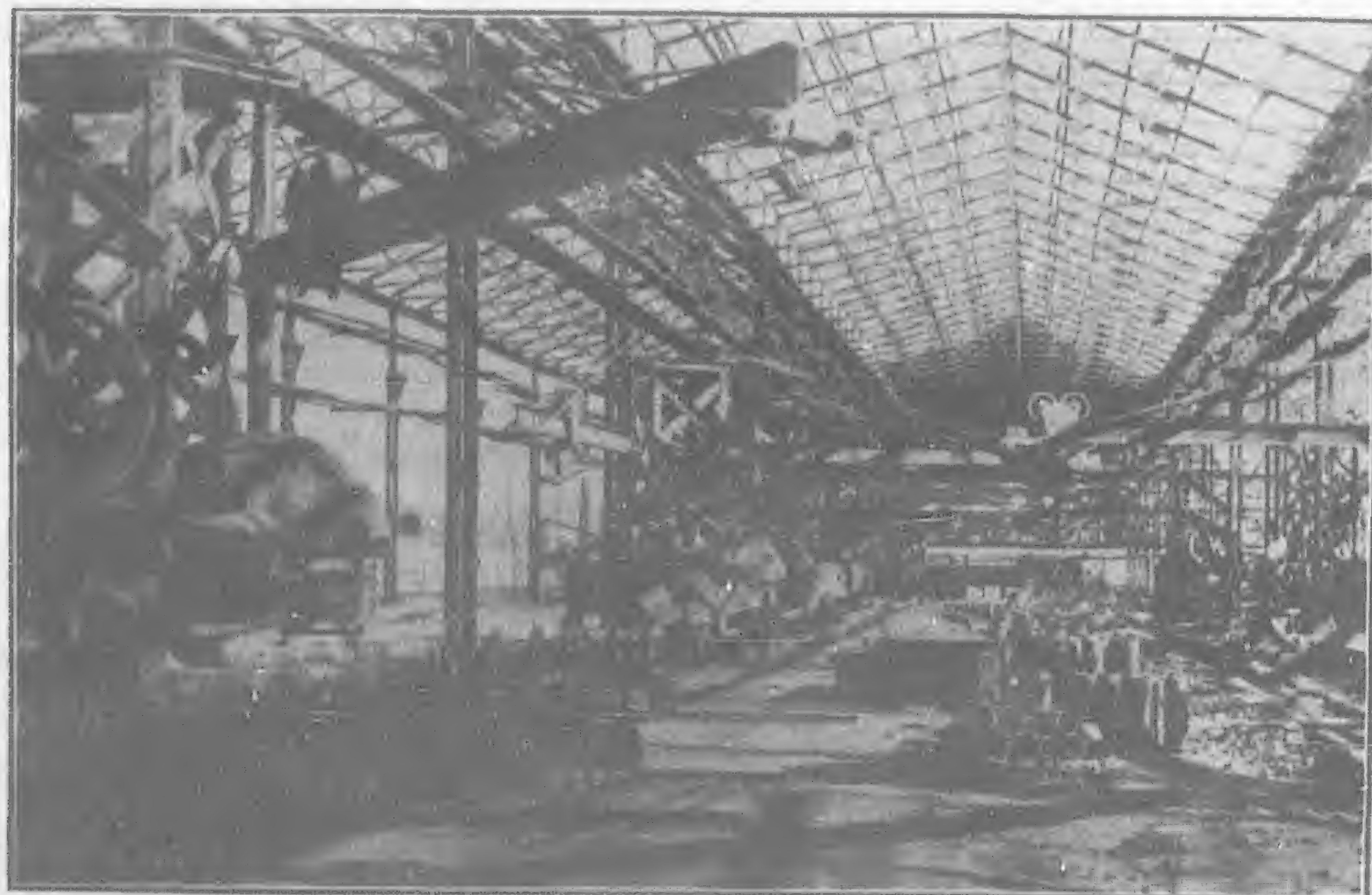
THE FAR EASTERN REVIEW



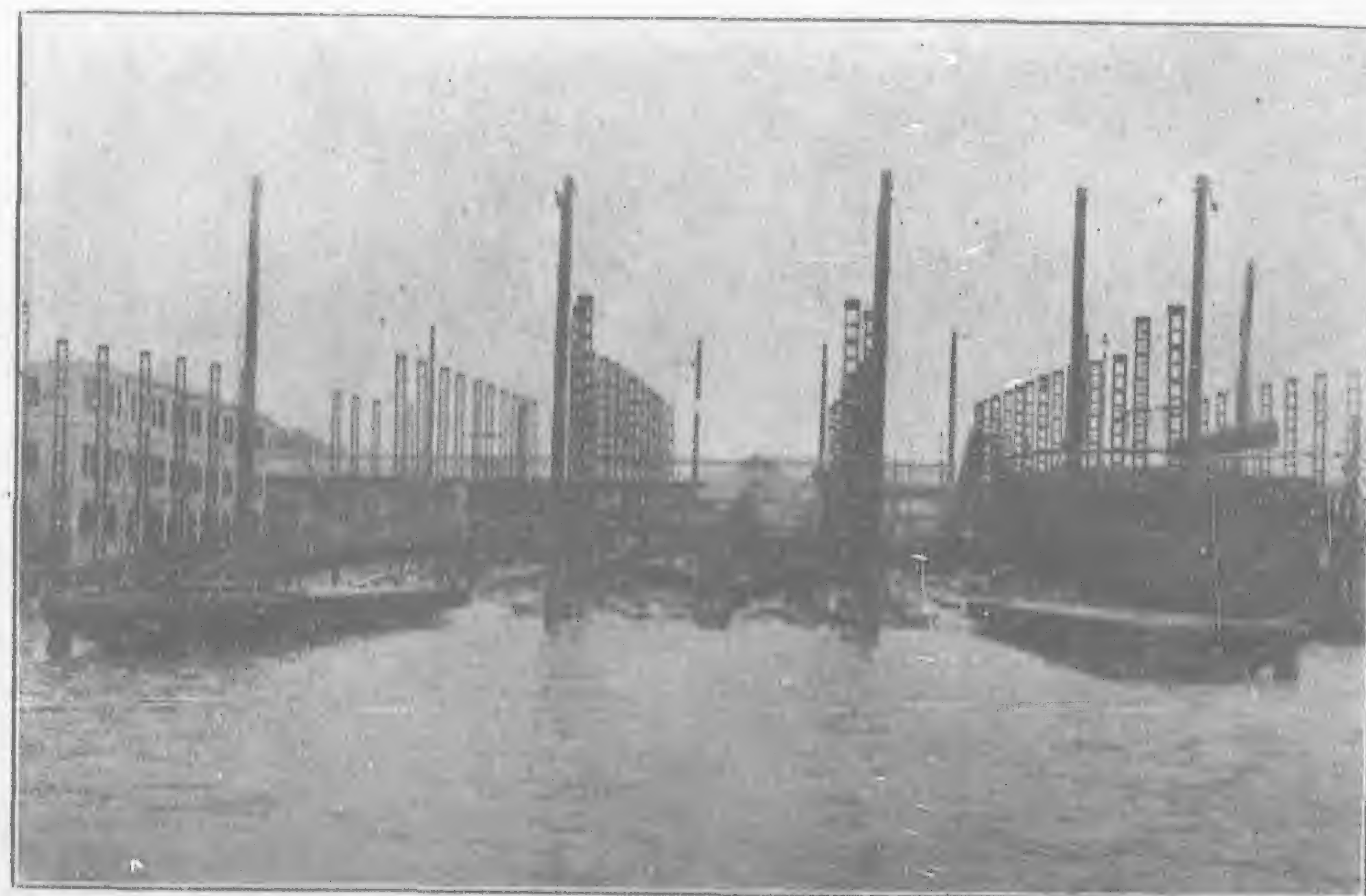
Roofs of Blacksmith's Shop, Engine Shop, New Offices and Stores



Head Office—Kowloon Docks



Plater's Shed—East Yard



Building Berths—East Yard

ing no less a sum than \$ 5,000,000 in extending its properties and preparing them for the future. The present No. 1 dock, which is 700 feet long by 86 feet wide, is already too small to cope fully with every demand. The company therefore, are completing arrangements for the construction of a new dock, whose dimensions 1,200-ft. by 120-ft. will fill every requirement for many years to come.

The head office is situated at Kowloon Docks, 15 minutes by launch from Hongkong. The town office is in Queen's Buildings, Hongkong.

The following is a brief description of the docks, slipways and workshops at Kowloon Docks :—

NEW GRAVING DOCK :—

Proposed length inside 1,200-ft. divided into two docks by a sliding caisson, giving length to outer dock 470-ft. and inner dock 710-ft.

Length from floorhead to inside of caisson ..	1,200-ft. 0-in.
" of inner portion from ..	710 " 0 "
" of outer portion from ..	470 " 0 "
Breadth of entrance at coping ..	120 " 0 "
" at sill level ..	120 " 0 "
" of dock at coping ..	158 " 0 "
" of dock at level of top of keel locks ..	121 " 0 "
Depth of water over sill (O.H.W.) ordinary spring tides ..	45 " 6 "
Depth of water over sill (O.L.W.) ordinary spring tides ..	37 " 6 "
Depth of water over sill at mean sea level (i.e., 4-ft. above admiralty datum) ..	40 " 0 "
Height of keel blocks over sill ..	Level with sill.

No. 1 DOCK :—

Length from floorhead to bilge of caisson (outerstop) ..	700-ft. 0-in.
caisson (innerstop) ..	688 " 0 "
Breadth of entrance at coping ..	86 " 0 "
Breadth of dock coping ..	127 " 0 "
Breadth of dock-pillar to pillar ..	70 " 0 "
Depth of water over sill (O.H.W.) ..	29 " 0 "
" (O.L.W.) ..	22 " 0 "
Height of first block over sill ..	12 "

No. 2 DOCK :—

Length from floorhead to bilge of caisson ..	371-ft. 0-in.
Breadth of entrance at coping ..	63 " 0 "
Breadth of dock coping ..	90 " 0 "
" pillar to pillar in line with top of keel blocks ..	55 " 0 "
Depth of water over sill (O.H.W.) ..	17 " 10 "
" (O.L.W.) ..	10 " 10 "
Height of block over sill ..	2 " 5 "

No. 3 DOCK :—

Length from floorhead to bilge of caisson ..	264-ft. 0-in.
Breadth of entrance at coping ..	48 " 0 "
Breadth of dock coping ..	61 " 6 "
Breadth of dock pillar to pillar across top of keel blocks ..	38 " 4 "
Depth of water over sill (O.H.W.) ..	13 " 6 "
" (O.L.W.) ..	6 " 6 "
Height of first block over sill ..	Level with sill.

No. 1 SLIPWAY :—

Length of slipway ..	650-ft. 0-in.
Breadth ..	56 " 0 "
Declivity ..	9/16" per foot
Extreme length of cradle ..	238-ft. 6-in.
Length of blocks ..	238 " 6 "
Declivity ..	11/32" per foot
Water on blocks at fore end (highest) ..	11-ft. 6-in.
Water on blocks at fore end (lowest) ..	4 " 6 "
Maximum load—1,400 tons.	

No. 2 SLIPWAY :—

Length of slipway ..	525-ft. 0-in.
Breadth ..	46 " 0 "
Declivity ..	9/16" per foot
Extreme length of cradle ..	200-ft. 0-in.
Length of blocks ..	200 " 0 "
Declivity ..	9/32" per foot
Water on blocks at fore-end (highest) ..	9-ft. 6-in.
" (lowest) ..	2 " 6 "
Maximum load ..	900 tons

SHEERLEGS :—

Test load ..	100 tons
Working load ..	80 "
Maximum overhang ..	23-ft. 0-in.
Steam driven.	
Depth of water at low tide ..	18-ft. 0-in.

CANTILEVER CRANE :—

Lifting capacity ..	10 tons
Depth of water at low tide ..	16-ft. 0-in.
Electrically operated ..	

An ample number of buoys with sound moorings are in place opposite the works, where vessels of all sizes can remain safely moored.

The company has under contemplation, the erection of a 200-ton crane, on a site near the present sheerlegs. The Sheerlegs will be removed to the west yard. A sheerlegs capable of lifting 10 tons occupies a position at the entrance to No. 2 dock.

ELECTRIC CAPSTANS.—Nos. 1 and 2 docks have electric capstans of three and five tons pull, the 5 ton being fitted with Williams, Janney hydraulic reduction gear.

NOS. 1 AND NEW DOCK PUMP HOUSE.—The entire chamber is built of concrete, the floor of the suction chamber being at a level 62-ft. below the cope level of the dock with connecting culverts from the No. 1 and New Docks. The pumps are placed directly above the suction chamber, and the floor of the pump is 34-ft. below the cope level. The chamber is equipped with five 42-in. twin parallel type centrifugal main pumps, each driven by a 550 h.p. slipring motor operating on a 2,200 volt, 3 phase 60 cycle circuit. These will be capable of emptying the proposed new dock in 3½ hours. In addition, the chamber is equipped with two 12-in. drainage pumps, each capable of delivering 3,000 gallons of water per minute, and each driven by an 84 h.p. squirrel cage motor, also one fire pump set consisting of a 6-in. branch 2 stage turbine pressure pump, capable of delivering 450 galls. per minute against a pressure of 100-lbs. driven by a 55 h.p. squirrel cage motor operating on a 2,200 volt 3 phase 60 cycle circuit, and one 100 k.w. motor-generator set for ships temporary lighting at any voltage from 60 to 220.

NOS. 2 AND 3 DOCK PUMPING PLANT.—The pump house is equipped with three 20-in. centrifugal pumps, driven by three h.t. slipring motors, capable of enveloping 85 h.p. on a 2,200 volt, 3 phase 60 cycle circuit. The three pumps running simultaneously are capable of emptying No. 2 dock containing approximately 12,230 tons of water in 1 hour and 20 minutes. There are also two 6-in. centrifugal drain pumps driven by 440 volt 3 phase squirrel cage motors, and one fire pump as in No. 1 dock pump chamber, and one charging set for priming main pumps.

The dockyard at Hunghom, Kowloon, consists of two separate building yards. On the west side, the yard contains seven concrete building berths, suitable for ships of the following lengths :

1—630-ft.	3—420-ft.
1—500-ft.	2—120-ft.

each berth being equipped with aerial ropeways cable of dealing with weights up to 4 tons. In the east yard, there are 3 concrete Building berths suitable for ships up to 800-ft. long by 80-ft. beam. Each berth is equipped with 3 or 5 aerial ropeways, capable of dealing with weights up to 4 tons. Electric winches, fitted with hoisting and transporting gear are placed under each ropeway at upper end of berth. Jib derricks are placed at convenient positions on each side of ship under construction. Electric winches are provided at base of derricks capable of lifting 3 tons. Both yards are fully equipped with electrically driven machines for building the largest vessels, the machines being placed in platers shed running across the heads of the shipbuilding berths.

The power house in the west yard is equipped with three 350 kilowatt, 6 phase rotary converters, converting through suitable transformers from an h.t. bulk supply of 2,200 volts 3 phase 60 cycles to 250 volts d.c. These supply the necessary motors and lighting throughout this yard, while the east yard power house is supplied by alternating current, 2,200 volts 2 phase 60 cycles transformed to 220 volts 2 phase for power and 100 volts for lighting.

The platers shed in the east yard is 420-ft. by 120-ft. divided into 3 bays. This shed is fitted up to date with all the latest machinery for punching heavy material. Three overhead electric cranes are installed for lifting material to machines as required, the heavy machinery consisting of a Doxford patent joggling machine, Lambie hydraulic press, Smith Bros. plate bending roll, two scalping machines and two plate edge planing machines, one plate

mangle, angle cutting machine and bar straighteners, four countersinking machines, 8 Bennie punching machines of heavy type, one Lysholm punching table, two friction saws, one cold saw for cutting angles cold, one rivet cutting machine, and a Smith Bros. large hydraulic plate flanging machine.

Adjoining the platers shed in the east yard is the bending shed—60-ft. by 50-ft., which has a furnace capable of taking in angles up to 60-ft. long. Scriven's frame bevelling machine and smith's hydraulic jacks are used for frame setting and bending.

A similar platers and bending shed is situated near the building berths in the west yard.

Hydraulic plant is fitted throughout each yard for both rivetting on ground and on ship, while compressed air plant is used for drilling, caulking and rivetting, and for driving auxiliary plant. Two 23 by 16 by 13 motor driven two stage intercooled air compressors are installed, one in the east end of shipyard, and one in the west end, both situated centrally for the distribution of air pressure at 100-lbs. per sq. inch. A 6-in. main is led from air compressor around the yard with 4-in. and 2-in. subsidiary branches led to each building berth, engine shop, boiler shop, foundry and smithy, and also to each slip and dry dock. The main pipe line is so arranged that the two compressors can run connected together or separately. Tools available for issue to workmen include: rivetting hammers, caulking hammers, drilling machines (rock, corner and vertical). Holding up hammers are also available suitable for all classes of work. Twist drills, reamers, chipping and caulking chisels and tools of every description are housed in a large store, fitted up specially for pneumatic tools, wherein a special system of checking issues and returns is carried out, and a record of all breakages and spares kept.

The method of distributing hydraulic plant pressure is similar to that of compressed air. A 3-in. main is carried around the shipyard, with branches taken to each department. Hydraulic presses in boiler shop for flanging boiler plates are supplied in this way, and all manholes, lumber holes, joggling and flanging required for plates and angles bars are done by this method by machinery distributed in the platers shed and boiler shop. Power is supplied by two motor driven hydraulic pumps operated automatically by rise and fall of the accumulator requiring little or no attention by attendant. These pumps were supplied by Messrs. Fullerton, Hogart and Barclay of Paisley, and give every satisfaction. One pump is situated in the west yard and one in the east, and generates a pressure of 1,000 per sq. inch continually. Keels, centre girders, floors, frames and stern bars are worked by this method, and in the boiler shop, boiler shells furnaces and combustion chambers are rivetted by hydraulic pressure, which ensures efficient and good workmanship in all cases.

MACHINE AND ERECTING SHOP.—This building consists of 4 bays—375 ft. by 80-ft. by 75-ft. In the east bay are lathes—30-in. centre, 70-ft. between heads, 30-in. centre, 30-ft. between heads and 6-ft. centre by 30-ft. between heads for crank shafts, and various smaller lathes and planing machines, the largest of which is capable of taking work 8-ft. by 8-ft. by 20-ft. travel, and other smaller planers down 3-ft. by 4-ft. by 8-ft. travel. There are also several horizontal boring and tapping machines, the largest of which can bore tap to 3½-in. dia. and two cranes electrically driven, capable of lifting up to 50 tons. All machinery in this bay is electrically driven, each machine having its own motor.

EAST CENTRE BAY is principally used for erecting engines. Two electrically-driven cranes are situated in this bay, one of 50 tons and one of 15 tons lifting capacity.

WEST CENTRE BAY in which are housed various makes of small high speed, screw cutting and surfacing lathes, high speed radial drilling machines, milling machines of various makes and condenser ferrule making machines, turret lathes and stud making machines and one planing and slotting machine combined (planing 20-ft.—slotting 16-ft.), catalogued as horizontal and vertical planer. All machinery in this bay is also electrically driven,—the overhead electrically driven crane having a lifting capacity of 10 tons.

WEST BAY in which are housed various screw cutting and surfacing lathes of 20-in. to 12-in. centres of high speed type, planing machine 6-ft. by 6-ft. by 18-ft. travel, 36-in. centre lathe for crank shafts, 6 stroke slotting machine, gear wheel cutting machine capable of cutting wheels up to 4-ft. dia. and several milling machines and horizontal boring machines. The lower end of the bay is used for erecting machinery, and has an electrically driven overhead crane with a lifting capacity of 25 tons.

The brass finishing shop, which is principally used for ship furnishing work, contains lathes, drillers, milling machines and engraving machines, all capable of turning out brass work at short notice. The machinery here is also driven electrically by independent motors.

ELECTRIC SHOP.—This is equipped to deal with repairs of all description, both A.C. and D.C. A large stock of material is carried, and entire ships installations can be fitted.

GALVANIZING SHOP.—The zinc is electrically deposited, articles being cleaned by sand blasting. The dimensions of the galvanizing tanks are 21-ft. 9-in. by 6-ft. 8½-in. by 5-ft. 6-in. and 6-ft. by 8-ft. by 5-ft. respectively. The plant is capable of dealing with three tons per day. Electro plating in copper, nickel and silver.

PATTERN SHOP.—The pattern shop, under the same roof as the machine and erecting shops, covers an area of 100-ft. by 70 ft. on the first floor, which is reached by a flight of stairs and an electric lift capable of raising 1 ton to deal with patterns to and from the foundries and wood from the sawmill. The traveling crane of 25 ton capacity, traversing the whole of the shop, raises the large timber and castings (which are to be renewed), coming from the harbor, from the machine shop floor to any part of the pattern shop. The main shaft, driven by a 10 h.p. motor, drives No. 1 lathe, a chuck on the mandril dealing with jobs up to 5-ft. dia., while the bed will deal with work 12-ft. long and 15-in. dia. Nos. 2 and 3 lathes deal with the smaller turned work. The band saw, 36-in. wheels, deals with work up to 8-in. thick, the table 3-ft. square, and can be angled to suit the work in hand, the distance from the saw to the inside of the gap being 3-ft.

The wondersander, a combination of spindle and surface sandpapering machine by Matthew Wylie & Co., is housed here together with the following machines:—

A jig saw, 4-in. stroke, the table 2-ft. 6-in. square and 2-ft. 2-in. in the gap. Driven off main shaft.

A patent pattern making machine by Wadkins, Leicester, is driven by an independent reversible motor, dealing with patterns of almost any size and shape.

A surface and thicknessing machine by Thomas White & Sons, deals with timber 24-in. wide by 8-in. thick, is also driven by an independent motor. By its side at a reasonable distance, is a surfacing machine of 12-in. capacity, having a fence to deal with angular timber.

A dimension sawing bench by Sagar, carries a rip and a cross cut saw, each 15-in. dia., driven by separate motor.

A saw bench by Robinson, Rochdale, completes the machinery, this carrying a saw 22-in. dia. by 4-ft. 3-in. by 2-ft. 3-in. table, and motor.

There are 10 work benches, each capable of accommodating four workmen each.

COPPERSMITHS AND PLUMBERS DEPARTMENT.—Adjoining the engine shop are the coppersmiths and plumbers shops occupying a building 127-ft. by 35-ft. wide, with glass and corrugated galvanized iron roof, efficient ventilation and light. This shop is equipped with all necessary and up-to-date methods for making and bending all sizes of pipes for shipbuilding and engineering work. In addition, sanitary engineering is done on a large scale, and heating apparatus for both ships and buildings.

Equipment.—Hydraulic plant capable of pressure up to 1,000 per sq. in. for bending all kinds and sizes of steel and copper pipes.

Eight forges fitted with under feed system of air blast, supplied by a Roots blower.

Vice benches and lockers to accommodate 200 men.

Overhead rail for traveling chain blocks over bending blocks and forges.

Electric lighting on the ½ watt. system, all overhead. Benches lit by projecting arms to each vice by 16 c.p. lamps.

TINSMITH'S DEPARTMENT.—40-ft. by 42-ft. wide. This Department is responsible for making the models exhibited by this company at the British empire exhibition and is capable of undertaking the following:—

Air tanks for lifeboats and liferafts, ships domestic fittings, compass hoods, light water tanks, and all classes of sheet iron, tin and zinc work are turned out in considerable quantities. Steam heating and drying cabinets of all sizes, suitable for large hotels and passenger ships are made here complete. Ships navigation and other types of lamps are furnished by this department for ships as necessary. Plate rolls and wire crinkling machines are installed.

Vices and plate racks are also fitted, and all necessary dies and jigs for all classes of repeat work are available. In addition, a large store for ready issue of tools and material to workmen is installed.

BOILER SHOP.—The boiler shop, a substantial building of stone and lime 330-ft. by 130-ft., is fitted with machines capable of building any size of boiler under Lloyd's and board of trade rules.

The following machines comprised therein, give one an idea of the capacity of this shop:—250-ton hydraulic double ram flanging machine, vertical rolls capable of taking in plates up to 2-in. thick, 5 screwing machines for screwing stays, 2 milling machines, 4 drilling machines, 4 electric overhead cranes, 60 ton, 45 ton, 35 ton and 15 ton respectively, 2 hydraulic rivetting machines, 2 planing machines, 2-5 ton hydraulic jib cranes over flanging machines and one annealing furnace capable of taking plates 18-ft. by 30-ft.

SMITHY.—On the right of the machine shop, a separate building 200-ft. by 150-ft., is capable of carrying out all kinds of smith work for shipbuilding and engineering. The plant contains 2—1 ton, 7—10 cwt., and 1—5 cwt. electrically driven Massey's hammers, capable of making forgings to 20 tons weight, either in shingled iron or steel. The forge adjoining the Smithy is equipped with machines to turn out forgings to 20 tons weight either in shingled iron or steel. The plant comprises one steam hammer of 10 tons and one of 2 tons, for smaller work.

MOULDING SHOP.—The moulding shop at present under construction consists of three bays adjoining each other.

No. 1 BAY 320-ft. by 63-ft.—Contains one 10-ton and one 5-ton cupola, a steel melting furnace, one drying stove 25-ft. by 12-ft. by 10-ft., one annealing stove 25-ft. by 12-ft. by 10-ft., one small core drying stove 10-ft. by 8-ft. by 6-ft. and one magnetic separator and sifter. This bay is served with two 15 ton electric overhead traveling cranes, and one 5-ton mono-electric crane on each side of bay.

No. 2 OR CENTRE BAY.—320-ft. by 56-ft. is the brass foundry, and contains one 8-ton brass furnace, one 5-ton brass furnace, and 4 small tilting brass furnaces, all served by one 15-ton overhead electric traveling crane.

No. 3 BAY.—For heavy iron casting work, is served by two 20-ton overhead electric traveling cranes, and one 5-ton monocrane, one each side of bay. It also contains one 10-ton cupola, and one drying stove 25-ft. by 12-ft. by 10-ft.

For rapid handling of material, the shop is well served with a heavy rail track to each bay, connecting machine shop and engine shop, and for the moulding of wheels, the shop is well equipped with a Whittaker's patent moulding machine, capable of moulding all classes of spur, bevel or helical wheels from a small pinion to a wheel of 15-ft. diameter. The daily output of the foundry is 80 tons of iron brass and steel castings.

JOINER SHOP.—The joiner shop is housed in a recently constructed modern brick building, having re-inforced concrete floors on steel girders, supported on steel columns in two rows down the centre of building. The ground floor contains the sawmill. The first and upper floors have each an area of approximately 12,540 sq. ft., and are arranged in three bays with columns. The centre Bay in the former is utilized as a machine shop, and comprises up-to-date circular and band saws, fast feed moulder, oliver twin saws, whitney planer—large drum and disc sand papering machines, spindle machine, double tenoning machine, chain, hollow chisel and automatic slot blind mortising machine, automatic dovetail machine, vertical boring and routing machines and two turning lathes. Machines are all driven by motor power, some in groups and some by direct coupling to motor, and are worked by specially trained workmen capable of turning out first-class work, light or heavy. The side bays on both floors are arranged with benches for workmen, while the centre bay on the upper floor is used for the erecting of deckhouses, skylights, railway cars, tram cars and motor bus bodies, and all other work of a heavy nature. A portion of this floor is partitioned off for use as a polishing shop. The first and upper floors are served with a crane, capable of lowering material direct from shop to railway truck, and thence by electric crane to lighter. The whole building is well lighted and ventilated, thus affording every facility for carrying out all work in a speedy and first-class manner.

SAWMILL.—Alongside the sawmill building is an electric traveling crane on a gantry, under which there are three frame saws and a circular saw with fifty-foot rack bench. This arrangement enables this department to convert logs and heavy timbers with

ease. The mill is provided with modern high speed moulding and planing machines, circular saws and all the necessary smaller machines to enable the department to handle a large amount of work rapidly and efficiently. A variety of timbers are worked—teak and Douglas fir (Oregon pine) being the principal. An average of 600 tons of teak and two and a half million board feet of pine are worked in one year.

A heavy rail track is laid throughout the yards and workshops, and approximately 100 fire hydrants and numerous fire hose boxes are situated at convenient intervals. Each graving dock is provided with an independent electric fire pump, while two modern fire engines are kept in readiness for any outbreak.

STORES.—This department is one of importance, as in all shipbuilding yards situated far from manufacturing centres. A large and varied stock has to be carried, a vigilant eye has to be kept on depletions, due to the enormous demands made from time to time by the various departments engaged in shipbuilding, ship repairing, etc. The main store is a very substantial, well-ventilated structure of three stories of reinforced concrete floors on steel girders supported on steel columns. Handling of heavy stores is made easy by electric cranes to all departments. A feature of this department is that by a special arrangement of racks and bins, every article can be seen, making this store practically a show room. Everything is stocked from the proverbial needle to an anchor, in fact ocean-going ships have been built from stock, which fact is all the more creditable when it is borne in mind that the stores are thousands of miles from the manufacturing centres of Great Britain. The steel plate store is another fine building capable of housing 6,000 tons of material, handled by overhead electric travelling cranes. Further storage accommodation, situated on the ground floor of the main offices, contains valuable stocks of metals, tubes, bar steel, etc.

STAFF QUARTERS.—The staff quarters will ultimately comprise 9 blocks containing in all 64 houses. The sites for these houses and the access roads to same, have been prepared by excavating and levelling on the ground acquired by the company for this purpose. The houses are built in terraces of 8 to 10 houses, each house is self-contained and contains a drawing room, dining room and pantry on the ground floor, with two bedrooms and two bathrooms on the first floor. An excellent basement extends from back to front under each house. In addition, each house has a good wide closed-in verandah with tiled floors on both front and back. The kitchens are provided for by a back wing at ground level and ample accommodation for servants is given to each house in a separate building at the back. In the construction of these quarters, it has been the policy to endeavor to provide buildings which will require a minimum of maintenance costs, and with this object all the floors and roofs have been formed of reinforced concrete slabs, and also for coolness, an air space has been provided in the roof. The buildings are built of Canton brick, and all the wood used throughout is of teak. Tennis courts, bowling green and recreation grounds have been provided for the use of the staff, while the bathing beach in front of the first two blocks of houses, is considered by many to be the best in the colony.

COUNTING HOUSE AND OFFICES.—The counting house, offices and drawing offices are contained in one steel framed brick building, 380-in. by 65-in, situated between Nos. 2 and 3 docks. The floors and roofs are of reinforced concrete slabs, while the woodwork throughout is of teak.

A relay automatic telephone system is in use throughout the offices and yard.

The properties of the company, including Kowloon, Cosmopolitan and Aberdeen Docks cover an area of 96.49 acres, Kowloon Docks alone occupying 68 acres. The company is in a position to undertake all kinds of shipbuilding, marine and land engineering work, in addition to all classes of salvage work.

The company's twin screw ocean-going tug and salvage steamer *Henry Keswick* is a most powerful tug—2,000 h.p. recently built and engined complete by the company, and equipped with the most modern salvage plant and appliances for salvage work.

During a busy time, the Kowloon Docks have employed as many as 10,000 workmen, supervised by over 100 European foremen, experienced in every department of engineering and shipbuilding. A plentiful supply of native skilled labor is always available, and in this connection it may be interesting to mention that during the last year, the company spent in wages, an average of £25,000 per month, while during a busy spell, the wages bill per month reaches £40,000.

The Kowloon Shops of the Hongkong and Whampoa Dock Co., Ltd.

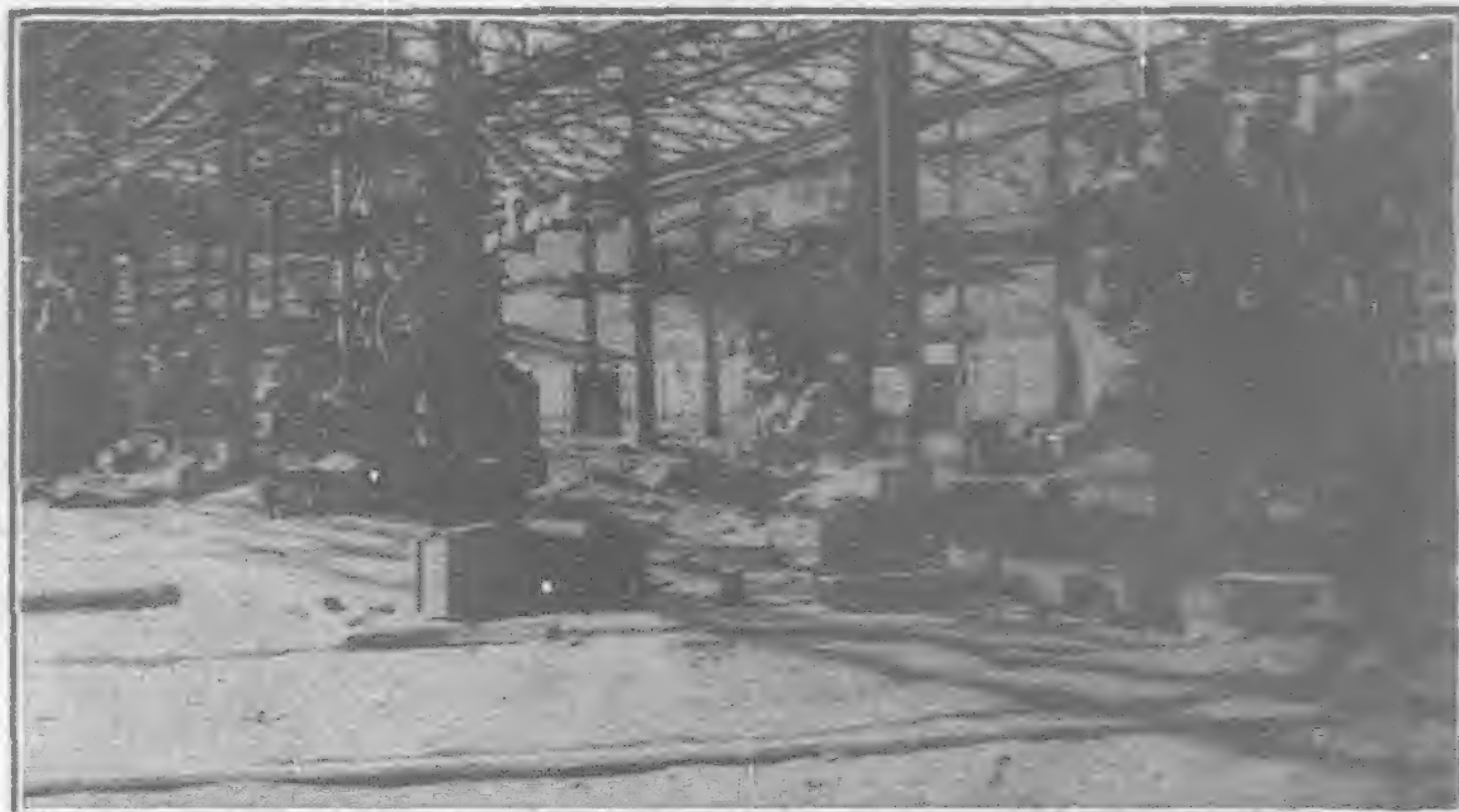
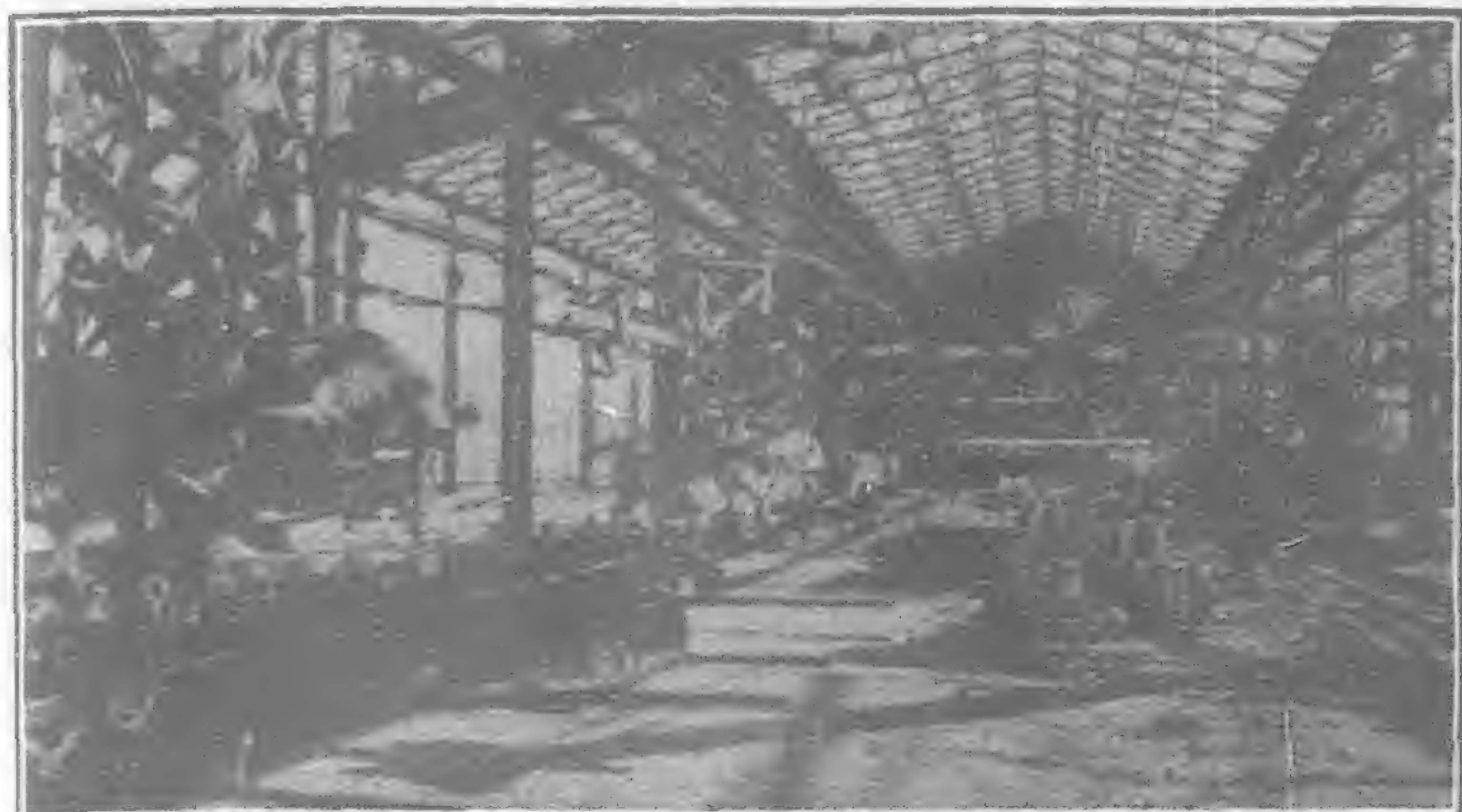
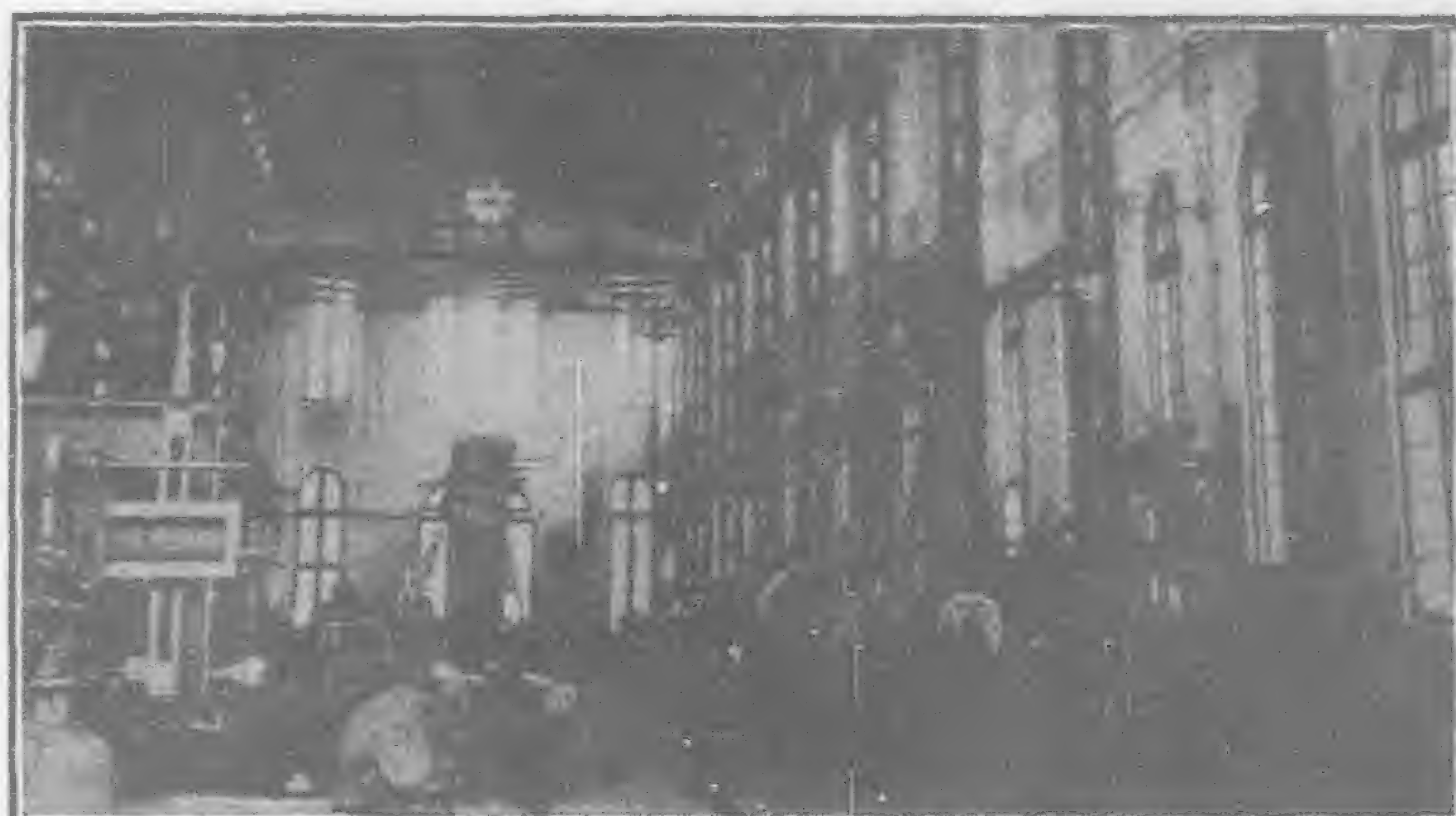
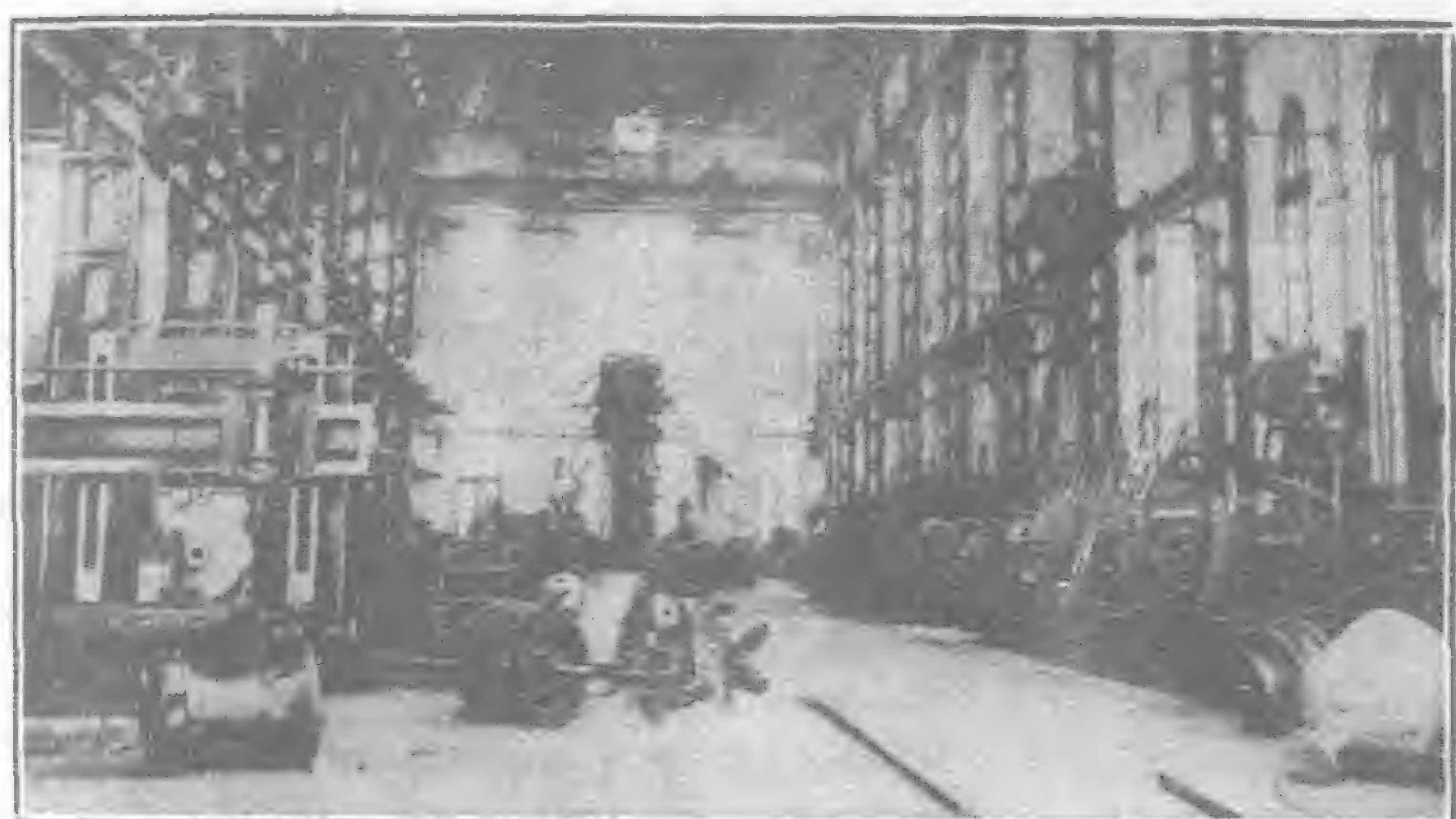


PLATE BENDING SHOP



THE MACHINE SHOP

COSMOPOLITAN DOCK.

In addition to the docks and shipbuilding yards at Kowloon, the company possesses a graving dock and shipbuilding and engineering yard known as Cosmopolitan Dock. This yard is situated on the west side of Kowloon Peninsula, and is about 15 minutes by launch from the island of Hongkong.

The dock is capable of taking ships up to 450-ft. by 57-ft. beam, and is built of granite. The dimensions of the dock are as follows:

Length from bilge of caisson to coping head	476-ft. 0-in.
Breadth of entrance at coping	85 " 6 "
Breadth of entrance at sill	58 " 0 "
Depth of water over sill, O.H.W.	21 " 9 "
Depth of water over sill, at ordinary spring tides	20 " 0 "

The pump house is equipped with two 27-in. centrifugal pumps driven by 2 h.t. slipring motors capable of developing 150 h.p. on a 2,200 volt, 3 phase, 60 cycle motor. The pumps are capable of emptying the dock, containing approximately 20,000 tons of water, in two hours and a half.

The buildings at this establishment comprise pattern shops, foundry, coppersmith's shop, heavy and light machine shops, smithy, boiler shop, sawmill and light ship building sheds. These buildings, which are all within easy reach of the dock, have recently been re-constructed, and are of a substantial type, as may be seen from the photographs. The plant which has been brought well up-to-date, is electrically driven throughout, and comprises almost 150 machines, each machines having an independent motor.

A pneumatic plant, hydraulic pumps, and electrically driven 6-in. fire pumps have recently been installed. Electrically driven overhead cranes operate in the machine shop and boiler shop.

The foundry is capable of turning out castings up to 15 tons, and is equipped with electrically driven cranes, and two patent brass furnaces.

The wharfs surrounding the dock are built of granite with six piers built with Billian piles and Yacal upper structures.

The sheerlegs capable of lifting 30 tons is built on the centre

pier, and is operated by steam winches. Two hand cranes capable of lifting 10 tons and 5 tons, are fitted at the dock entrance, and on the north side of the yard. The depth of water at sheerlegs pier is 20-ft. at low tide.

Two patent slips with electrically driven winches capable of taking launches and small vessels up to 120-ft. are on the west side of the yard.

The anchorage of Cosmopolitan Dock is the best in the harbor of Hongkong, and well sheltered from typhoons. Three buoys with sound moorings are situated 800 feet off the Dock entrance.

ABERDEEN DOCKS.

The property at Aberdeen referred to earlier, situated on the island of Hongkong, comprises the Hope Dock and the Lamont Dock. This is also a separate yard owned entirely by this company. These docks are of granite, and are of the following dimensions:—

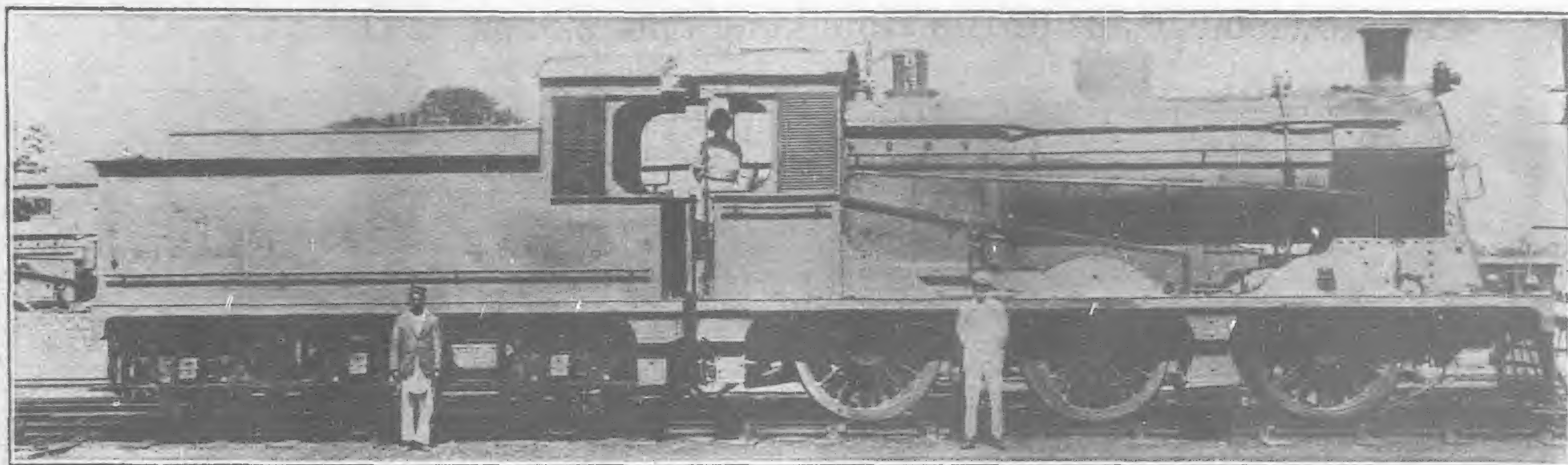
HOPE DOCK:—

Length from floorhead to bilge of caisson ..	433-ft. 0-in.
Breadth of entrance at coping	78 " 0 "
" of dock coping	98 " 0 "
" over keel blocks	56 " 4 "
Depth of water over sill, O.H.W.	23 " 0 "
" " " O.L.W.	13 " 6 "
Height of first block over sill	2 " 6 "

LAMONT DOCK:—

Length from floorhead to bilge of caisson ..	326-ft. 0-in.
Breadth of entrance at coping	65 " 6 "
" of dock coping	63 " 6 "
" over keel blocks	43 " 6 "
Depth of water over sill, O.H.W.	16 " 0 "
" " " O.L.W.	9 " 0 "
Height of first keel block over sill	2 " 4 "

The property on this site consists of a large European bungalow, cookhouses, office buildings, stores and machine shops. The docks and buildings are in a good state of repair, and are very valuable as an overflow establishment, when the other docks belonging to the company are occupied.



First Locomotive Landed and Ready to Leave for Home Station.

The Activities of a Great British Firm

Sir W. G. Armstrong, Whitworth & Company, Ltd.

Shipping Complete Locomotives from the Tyne to India

IN our January issue appeared an article describing the preliminary arrangements for shipping a cargo of 13 completed locomotives from Newcastle-on-Tyne direct to Calcutta there to be unloaded on the wharf and ready for starting off under their own steam. This shipment has since been delivered by Sir W. G. Armstrong, Whitworth & Company, Ltd. in conjunction with Messrs. Christen Smith Rederei, under supervision of the East India Railway Company. The engines conform to the following specification:—

0-6-0 Type. SUPERHEATED LOCOMOTIVE Gauge 5-ft. 6-in.			
Cylinders	Diameter	20-in. Heating	{ Tubes 917 sq. ft.
	Stroke	26-in. Surface	{ Elements 223 " "
Wheel	Coupled	5-ft. 1½-in.	{ Firebox 126.3 " "
	Tender	3-ft. 7-in.	{ Total 1,266.3
Firegrate Area			25.3 sq. ft.
Wheel Base	Rigid	15-ft. 6-in.	
	Total		
Engine 15-ft. 6-in. Weight in			
{ Total Engine Working Order	Engine	50.95 tons	
	Tender	40.25 " "	
{ and Tender 39-ft. ¾-in.		Total	91.20 " "

Boiler Pressure 160-lbs. per sq. in.

Tractive effort at 85 per cent. boiler tank capacity 3,000 gallons pressure 23,000-lbs. Boiler feed 2 G. & C. No. 9 fuel space, 7½ tons.

Messrs. Christen Smith's s.s. *Belgot* was used for this purpose after being suitably modified at the Armstrong naval yard under the supervision of the owners.

For the purposes of this shipment the *Belgot* arrived at Elswick jetty, which is served by a 150-ton hydraulic crane: for loading on September 18 and was ready to clear with 12 engines and one tender on deck, and 1 engine and 12 tenders in the hold on September 23.

The *Belgot* commenced her voyage on September 24 and after stopping at Oran, Port Said and Aden, and meeting with several periods of heavy

weather, arrived at the Kidderpur Dock, Calcutta, on October 3, having attained an average speed of 10.2 knots.

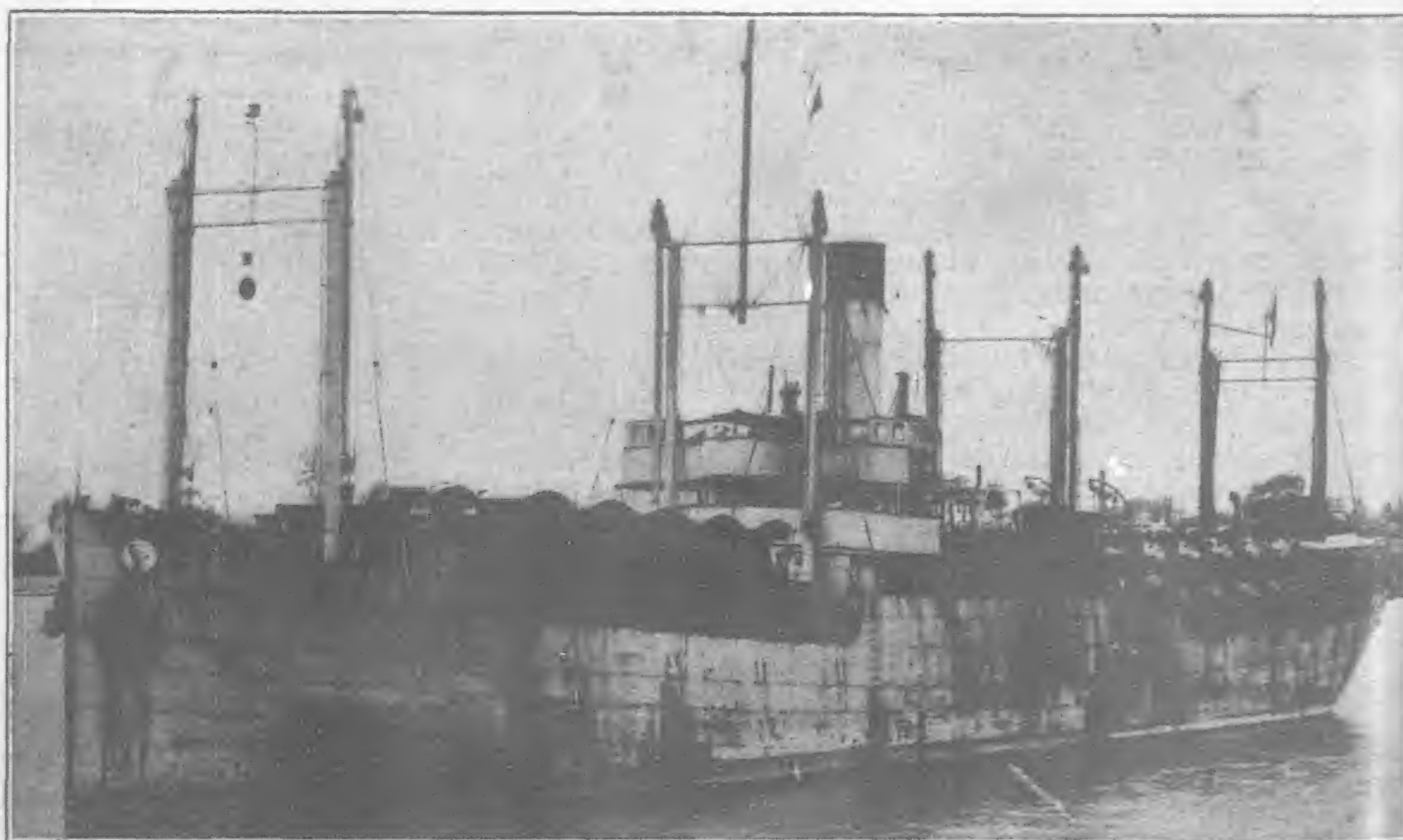
The tarpaulin covers were removed from the deck borne engines on the way up the river. The berth at the sheer legs being occupied, the *Belgot* did not berth until October 5 at noon and even then the first six engines were safely unloaded on to the quay by 6 p.m.

The first engine was hauled away to the Loco sheds of the East India Railway Company at dock junction east at 7.30 p.m. and owing to the arrangements made before shipment, negotiated the sharp curves which occur in this section in a satisfactory manner.

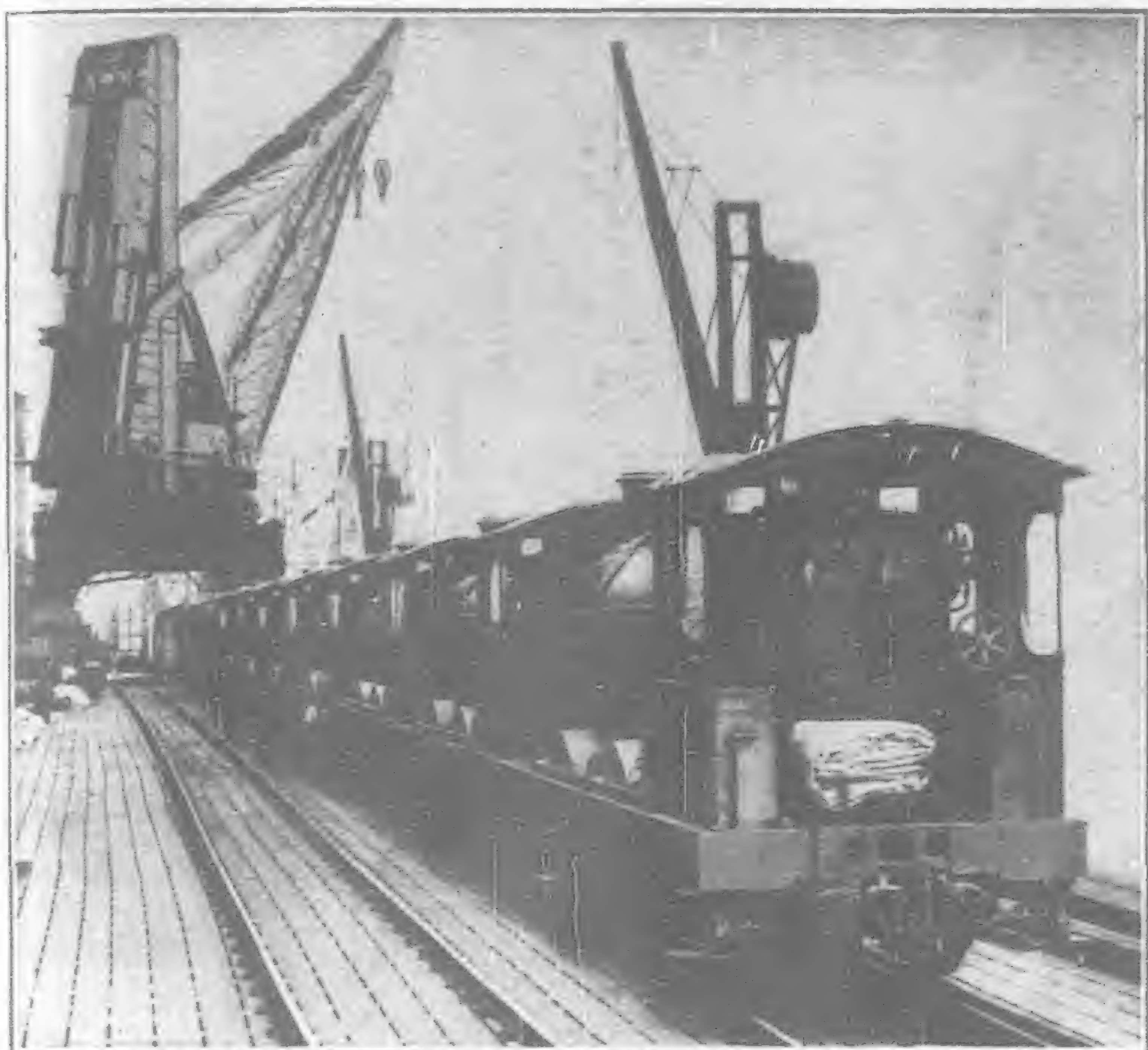
Saturday, October 6, was occupied by the East India Railway staff in examination and boiler testing to comply with the usual rules. The result of this test was completely satisfactory, every joint was found to be properly steam tight, and no rejoining was necessary at any point.

After lying over Sunday, the engine was steamed and ready to leave for its home station, Jha Jha, about 210 miles up to the line at 11 a.m. on Monday, October 9.

The journey was commenced at 1 o'clock, a halt being made at Bendel, 30 miles out, for examination. The engine being found



The s.s. "Belgot" leaving Elswick Quay with 12 locomotives and one tender on deck, loco and 12 tenders in the hold and four locos dismantled and packed in the usual manner.



Locos Awaiting Shipment on the Elswick Quay, Newcastle-on-Tyne

satisfactory, the journey was continued to Asansol, a distance of ninety miles on which section it ran in front of the Punjab mail train. From this point it proceeded to Jha Jha, arriving in excellent shape.

This engine was passed into service two days later. The remaining engines followed in due course as fast as the dock junction staff could handle them and all were cleared by October 20. After examination of the first few engines had proved that they had not suffered in transit, much of the opening up for inspection which had been carried out with the first few engines was dispensed with.

This is by no means the first occasion upon which Messrs. Armstrong, Whitworth & Co., Ltd., have shipped locomotives in running order but hitherto the deliveries made have only been to Irish and continental ports.



Loading the Locos at Elswick Quay.

The outstanding success of this experiment has proved the practicability of shipping locomotives complete to any part of the world and should revolutionize existing methods.

The saving effected in both time and labor charges for re-erection is a most important matter and on the present occasion the arrival in running order was especially welcome owing to the pressure of work in the East India Railway's shops, which would have made the erection of a number of new engines a serious matter.

Shipbuilding Record

The oil tank steamer *San Salvador*, launched on January 22 at the shipyard of Sir W. G. Armstrong, Whitworth & Co., Ltd., is the 137th oil carrier built by the firm bringing their total output of this class of vessel up to nearly 600,000 tons.

The *San Salvador* is the 13th vessel they have constructed for the Eagle Oil Transport Co. and is a sister ship to the *San Quirino* launched from the Armstrong yard in May last.

The principal dimensions of the *San Salvador* are: Length overall, 420' 5"; length between perpendiculars, 407'; breadth moulded, 52'; depth moulded to upper deck, 31' 6".

The vessel is designed to carry 8,250 tons on a mean draft of 25-ft. 3½-in. and her speed on trial, when loaded to this draft, is 11½ knots. She is of the two deck type, with poop, bridge and forecastle, and is built to Lloyd's highest class and framed on the Isherwood system.

The following work is at present in hand at the shipyards of Armstrong, Whitworth & Co., Ltd. :—

ARMSTRONG YARDS

Ascania, cargo and passenger liner for the Cunard Steam Ship Co., launched on December 20, 1923.



Locomotives in erecting shop ready for shipment

10,000 tons tanker—Societe Anonyme d'Armement d'Industrie et de Commerce, with Armstrong. Sulzer machinery.

10,000 tons oil tanker, vessel for sale.

60,000 tons floating dock for the Southern Railway Company, Southampton, five sections launched.

H.M.S. *Nelson*, battleship, for the British admiralty.

Girpsom cargo and passenger liner, for Brostroms Lines Agency, Ltd., Gothenburg.

The Humberarm Pipe Line for the big hydro-electric scheme in Newfoundland.

WALKER SHIPYARD

San Salvador, 8,000 tons oil tanker, for the Eagle Oil Transport Co., launched on the 22nd instant.

2—60-ft. gates for the London and North Eastern Railway, Co., Tyne Dock.

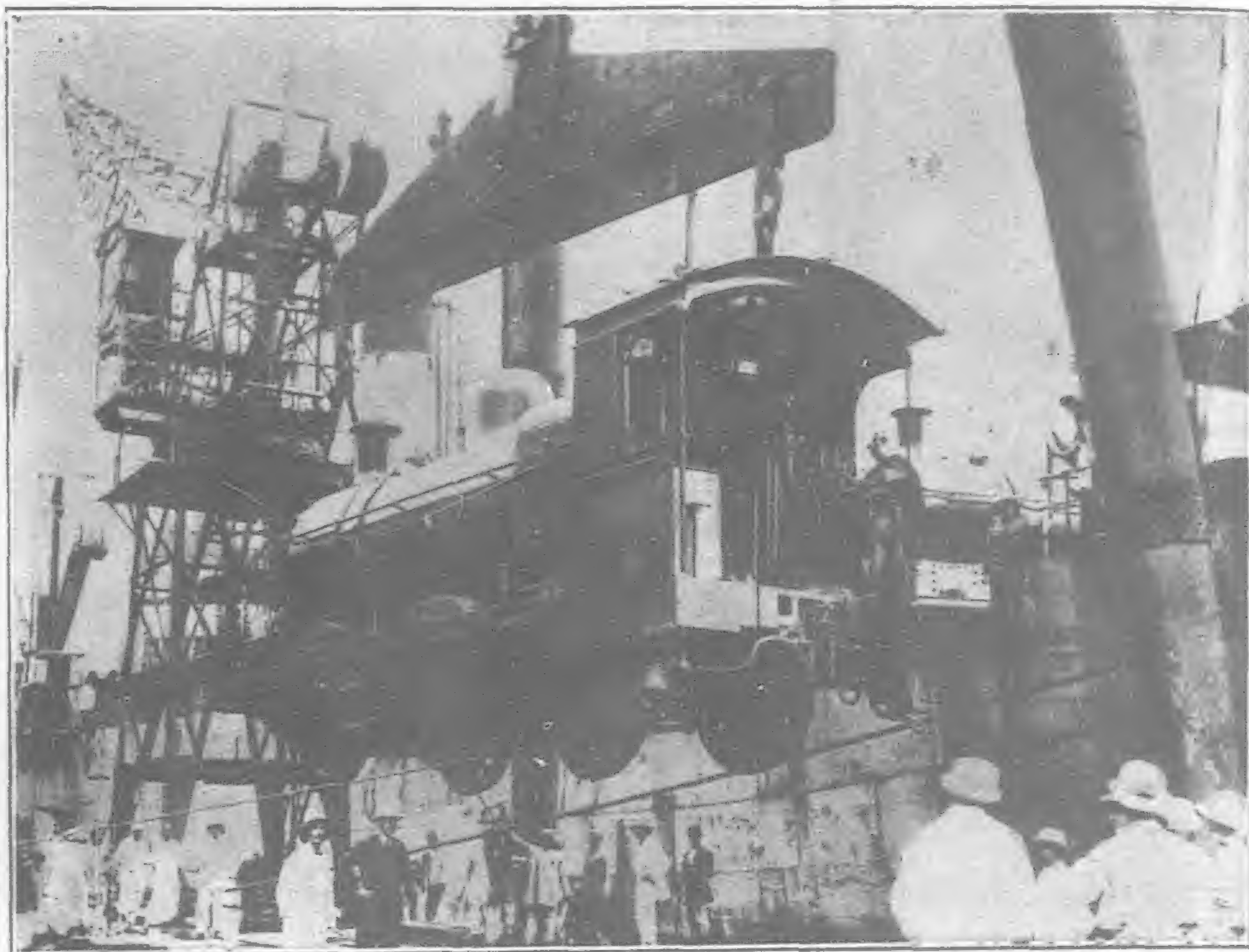
S.S. *Beldis* for Christian Smiths Rederi, Norway, fitted with Armstrong, Sulzer machinery.

In the British shipbuilding returns for 1923, Armstrong, Whitworth are placed 11th in a list of 163 companies. Only two vessels were launched during the year totalling 18,893 gross tons but small as this total is, it represents 3½ per cent. of the British output for the year. The aircraft carrier *Hermes* launched from the Armstrong, Whitworth yards in the summer of 1920 and at present completing at the Devonport Dockyard will be placed in commission early in February.

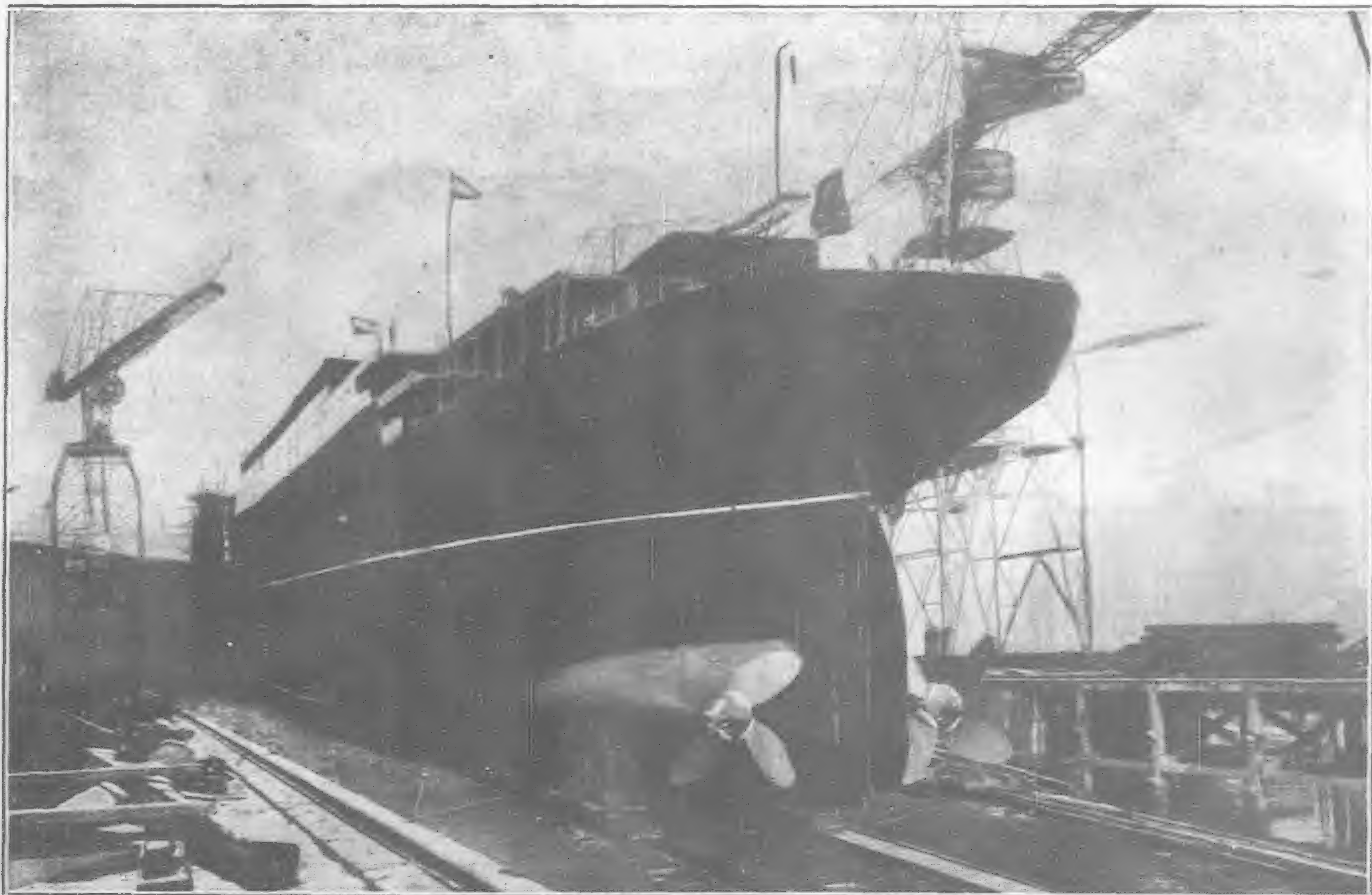
MARINE ENGINES

The shipbuilding returns for 1923 show that apart from Messrs. Harland & Wolff, Armstrong, Whitworth can claim the coveted dis-

inction of having held the *Blue Riband* for the greatest output of marine engines for two successive years. The marine engine department is of purely post-war growth, having commenced operations in 1918. Machinery built in 1923 includes the turbines for the Cunard Liner *Ascania* and the P. & O. Liner *Mongolia* and totals 38,850 i.h.p.



Unloading the s.s. "Belgot" at Calcutta.



Launch of the New Cunarder Liner "Ascania" from the Armstrong Yard of Sir W. G. Armstrong, Whitworth & Co., Ltd.

New Manchurian Bridge

The largest bridge in the Kwangtung Leased Territory was opened with appropriate ceremonies on May 14, in the presence of Director General Kawaguchi. This bridge which spans the Tasha-

ho is 25 feet wide and 308 yards long and cost some Y.140,000. The bridge connects the Pulantien and Pitzewo districts and is expected to increase traffic markedly from Pitzewo which is the most northerly port in the Leased Territory.

Some Exhibits at the British Empire Exhibition

Mather and Platt, Ltd.; Dorman, Long & Company, Ltd.; Yarrow & Company, Ltd. and John I. Thornycroft, Ltd. Make Imposing Displays of Their Products

1. Mather & Platt, Ltd.

THE well-known house of Mather & Platt, Ltd., Manchester, are contributing to the success of the Wembley exhibition in no small fashion. Their name will be prominent in many parts of the exhibition, for their wide range of manufactures indicates their ability to serve the needs of many industries. Their part is by no means limited to the fine display they have staged for their own stand. The familiar name is displayed on every stand in the B.E.A.M.A. section of the palace of engineering, for every stand is equipped, for fire protection, by Mather & Platt "Simplex" chemical fire extinguishers. These have been chosen as affording the maximum protection against fire, in accordance with the very stringent rules laid down by the exhibition authorities.

On their own stand in Avenues 8 and 9, Bays 11 and 12, Messrs. Mather & Platt have a most imposing exhibit indicative of the work they are doing in pumping equipment for waterworks service. This splendid set is one of seven similar sets which are being supplied to the Calcutta corporation for the Mullick Ghat pumping station. By the courtesy of the Calcutta corporation and of the chief engineer, J. R. Coats, Esq., B.Sc., M.Inst. C.E., this set is to remain throughout the whole exhibition as a fine example of British engineering. It comprises a high efficiency 18-in. "Medivane" pump, with a duty of 10,420 galls. per min., 140 feet head, 970 r.p.m. driven by a Mather & Platt 580 h.p. motor.

Mather & Platt have long been known for the excellence of their pumping and electrical equipment for mining service. It is therefore to be expected that an example of their robust design should figure amongst their exhibits—a six-stage Mather & Platt Plurovane high-lift pump, driven by a Mather & Platt mining-type 100 h.p. motor. This pump is designed for a duty of 750 galls. per min., 500 feet head, running at 1,450 r.p.m. Another exhibit is a Mather & Platt fire pump, motor, and automatic starter set—an exhibit whose general design and finish indicate its fitness for the important service it is destined to fill. A 6-in. Solovane pump, arranged of belt driving, is also exhibited.

Purely electrical exhibits on the Mather & Platt stand include an 80 k.w. D.C. generator and A.C. and D.C. motors.

Space precludes the exhibition of the heavier electrical manufactures of Mather & Platt, but it is interesting to note that a 500 k.w. rotary converter, with the unique Mather & Platt patent starting and self-synchronising system, has been supplied to the North Metropolitan Electric Power Supply Co., Ltd. for service in the exhibition grounds at Wembley. This machine will probably be open to inspection by the public.

The Textile Machine Makers' Association is equipping a working cotton mill at the exhibition, and Mather & Platt (who have a long experience in the electrical driving of textile machinery) are supplying eighteen electric motors for driving machines in this exhibit. The whole of the arrangements for fire protection, comprising a complete "Grinnell" automatic sprinkler and fire alarm installa-

tion, "Simplex" chemical extinguishers, "Armoured" fire doors, etc., are also carried out by Mather & Platt.

To the power house in the palace of engineering, in itself a working example of modern power house practice, Mather & Platt are supplying several auxiliaries. These include a 10-in. condenser circulating pump for Messrs. J. Musgrave & Sons, Ltd., a similar 12-in. pump to Messrs. Cole, Marchant & Morley, Ltd. for the same purpose, and a condenser extraction pump to the latter. These exhibits will be working continuously throughout the period of the exhibition. Miscellaneous small pumps for various duties have been supplied to other exhibitors.

In the *mining hall* the mining association are collecting a representative exhibition of models of mining machinery. To the collection Mather & Platt are loaning the original turbine pump—the first example of a multi-stage turbine pump—made by them in 1876 in conjunction with Prof. Osborne Reynolds.

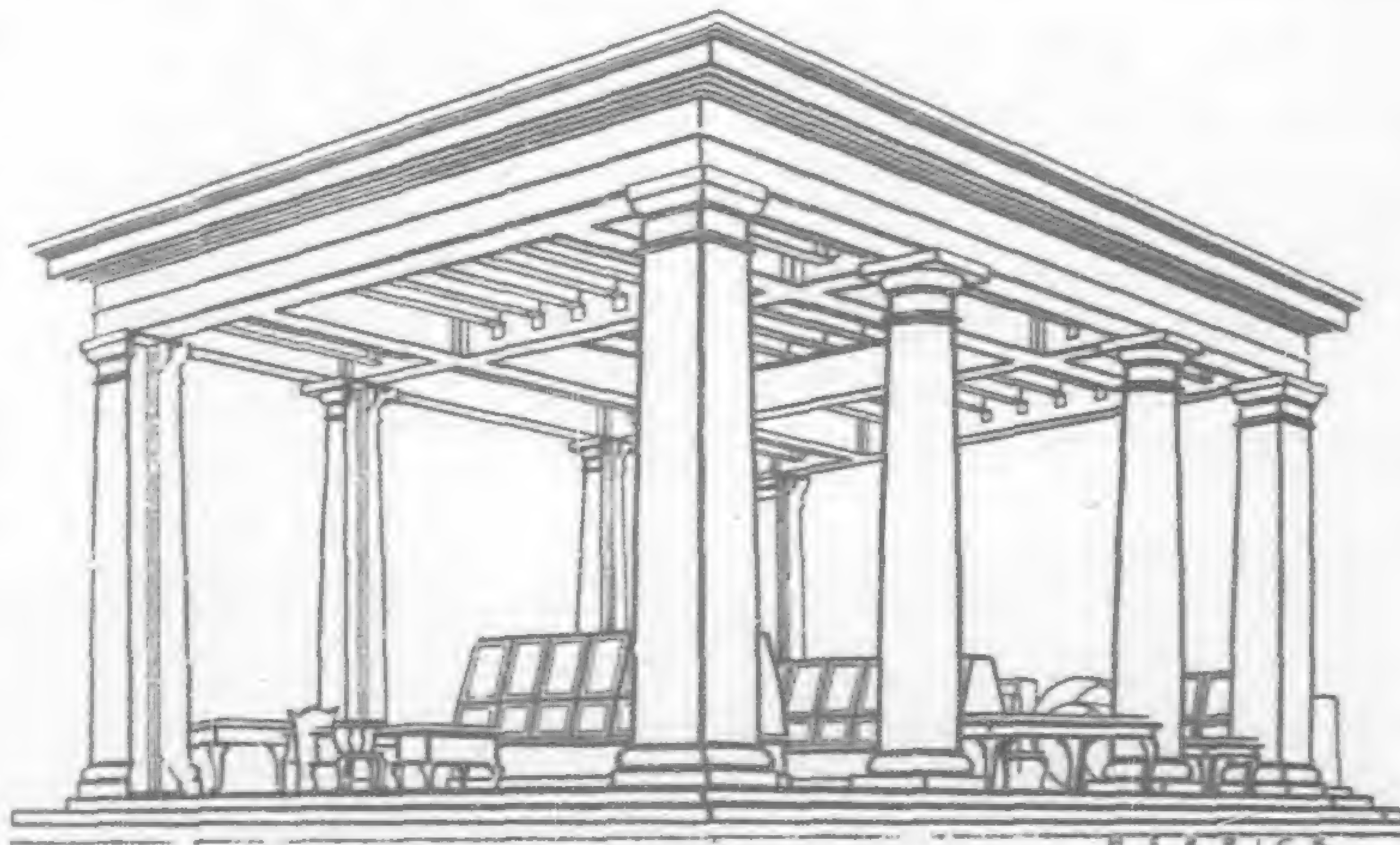
The bleaching, printing, dyeing, finishing and kindred machinery, for whose manufacture Mather & Platt are so well known, has far too wide a range to be represented adequately at one exhibition. There are shown, however, a clever model of a three-color printing machine, a L. & L. Weft straightener, and the "Vortex" humidifier, so extensively used to maintain suitable healthy conditions of humidity in textile and other factories. Electrolysers for the preparation of bleach liquors, for laundry use, for deodorisation, water purification, and many other uses, especially in hot countries are shown in large and smaller sizes. At the stand is also a Plauson patent colloid mill, a device for the preparation of emulsions and colloidal sus-

pensions for inks, pigments, sizes, etc., and wax and oil emulsions, for textile and many other uses.

2. Dorman, Long & Company, Ltd.

THE great Teeside steelmakers, Dorman, Long & Company Limited, are erecting an exhibit of unusual interest at Stand No. 43 in the palace of engineering. A far-reaching feature of this large concern's business is their control of production from the raw material—coal and iron ore—up to the finished steel, of which latter they have an output capacity of one million tons per annum.

With these great resources their products cover a wide field of industry and on the stand a thoroughly representative display will be on view of their various manufactures. Apart, however, from the samples exhibited the stand itself will claim much attention since it has been designed specially by Sir Edwin Lutyens, R.A., the eminent architect and creator of the stately cenotaph in Whitehall. The severe simplicity and beauty of line in the design of the stand has been translated into stone and marble in a manner that exemplifies the relationship between the architectural stonework or casing and the vital steel skeleton in the modern steel framed building. Certain portions are left open to show the construction of the internal steelwork of the columns and the roof.



The Dorman, Long Stand

The examples and specimens to be shown will include :—

Durham coal—from the company's several collieries, including coal for steam raising, gas production, coke making, and household purposes.

Coke for use in the blast furnaces for the production of iron.

By-products of coal, a most interesting section comprising a wide range of chemicals produced at the Company's central refinery and including benzol for motor spirit; coal tar, the source of synthetic dyes, drugs and perfumes; creosote, for timber preservation; and sulphate of ammonia, the richest known nitrogenous artificial fertilizer, for use in agriculture.

Ironstone, from the company's Cleveland mines and from a quarry in Northamptonshire.

Pig iron, specimens of the various well-known brands manufactured by the company.

The "Carlton" brands of ferro-manganese and Spiegeleisen.

Durham fire bricks from the company's own brickworks, for the lining of coke ovens and furnace flues.

Crushed slag for roads and concreting.

A ten-ton ingot of basic open hearth steel, representative of the company's output capacity of upwards one million tons of this steel per annum.

Blooms, billets and slabs of basic open hearth steel, for the manufacture of axles, crank pins, drawbars, bolts and nuts. For hammers, shovels, chisels, springs, saws, rifle barrels, shells and motor car bodies, etc.

The full range of New British standard beams (29 sections), channels (18 sections), equal and unequal angles (36 sections), bulb angles and tees (28 sections).

Specimens of pressed plate and rolled steel troughing for the flooring of buildings and decking of bridges.

A wide range of flat bars, round bars and square bars.

Specimens of the British standard bull-head and flange railway rails and tram-rails; and a very interesting selection of various special sections rolled in recent years for railways and tramways abroad.

Specimens of electric conductor rails for the electrification of railways including an unusual section for the central Argentine railway.

Examples of fishplates and soleplates and two complete specimen rail joints, one a standard British section and the other for the Great Indian Peninsula Railway.

Sections of bridge rails and light colliery rails and a number of other small special sections.

Of particular interest are four specimens of Dorman, Long's steel bent cold, showing its great ductility.

Steel plates for shipbuilding and constructional engineering work in thickness of from 3/16-in., to 2 inches, in length to 100 feet and in width to 9 feet.

Universal mill plates for bridge building and structural work, rolled simultaneously on sides and both edges and so eliminating edge shearing and machining by the user.

Riveted steel pipes—sections of the 72 and 57 inch diameter pipe lines for the Bombay municipality water supply. This contract is now being carried out in India by Braithwaite & Co., Engineers Ltd. (associated with Dorman, Long & Co.), and requires 80,000 tons of steel plates. The length to be provided is 80 miles of 72 inch pipe and 30 miles of 57 inch pipe.

Galvanized and black steel sheets. Specimens are shown of typical sheets and rainwater goods, ventilator louvres, fencing pales and glazing strips.

Wire. Galvanised steel hawser wire to Lloyd's tests, plough steel wire for colliery and lift ropes, steel railway signal wire, telegraph and telephone wire, galvanised rigging and seizing wire, galvanised armoring wire for submarine cables, drawn fencing wire, galvanised barbed wire, and steel rods for reinforcement of concrete.

There will also be shown a water color drawing (by Sir John Burnet & Partners) of Sidney Harbor Bridge. This is to be an arch bridge of 1,650 feet clear span—the largest single span bridge in the world—the total length of the arch and approach spans being 3,770-ft. Headroom for vessels passing in or out of the harbor will be 170-ft. at high water and the height to the top of the arch

will be 470-ft. above high water. The bridge is to carry four railway tracks, as well as a 57-ft. roadway and two footways, and will have a total width of 160-ft. This contract was placed with Dorman, Long & Company by the New South Wales government in February, 1924.

3. Yarrow & Company, Ltd.

OWING to the success of the Yarrow patent water-tube boiler (land type) a large-scale model some 14-ft. high of the latest type of Yarrow boiler is shown. This model, which is about one-third full size, is of a similar design of boiler to that which Messrs. Yarrow are constructing for different power stations and factories both in Great Britain and abroad. This boiler is also fitted with the Yarrow patent superheater and the Yarrow patent air-heater. The boiler is shown with the front casing removed so that the design and construction of the different parts of the boiler can be easily seen.

Among orders that Messrs. Yarrow & Co. have received for their land type of boiler it may be of interest to mention the boilers for the country of London Electric Supply Co.'s new super-power station at Barking; The Newcastle-upon-Tyne Electric Supply Co. boilers for the corporation of Brighton, Londonderry and Gravesend, and boilers for various industrial factories such as Messrs. J. & P. Coats, the Burmah Oil Company, and some sugar refineries in Scotland. Yarrow boilers are also being made for a power station in Holland, by a Dutch firm who are licensees of Messrs. Yarrow & Co.

A model is exhibited of the latest type of Yarrow patent marine boiler, fitted for oil burning, part of the casing having been removed showing the tube rows as well as the superheater. The actual boiler of this design is capable of generating steam for a 12,000 horse-power turbine installation.

Yarrow boilers to the extent of over 25,000,000 horse-power have been constructed or are in course of construction, and during the great war over 90 per cent. of the warships built for the British navy were fitted with Yarrow boilers.

There is also shown the first Yarrow boiler, built in 1887. This is the actual original boiler from which a great deal of experimenting was done, resulting in the present type, and it is interesting from an historical point of view.

An exhibit is shown of the *Cutty Sark*, built by Messrs. Yarrow & Co., to the order of Henry Keswick, Esq., Dumfries; a high speed turbine-driven yacht giving a speed of 21 knots, steam being supplied to the turbine machinery by two oil-fired Yarrow boilers. This yacht which is very well fitted up, has made several voyages including a trip right round the world.

There is also shown a motor yacht (Yarrow type) of 129-ft. by 20-ft., being an example of a type of same designed and constructed by Messrs. Yarrow & Co. and propelled by either steam or internal combustion engines.

Models are also shown of the following shallow draft river steamers (Yarrow type):—

A shallow draft vessel 210-ft. overall by 33-ft. beam, and draft of 5-ft. propelled by screws working in tunnels fitted with Yarrow's patent automatic flap, for service on one of the rivers in the East.

One of the river gunboats 230-ft. long by 36-ft. beam, designed by Messrs. Yarrow & Co., which took a prominent part in the operations at Mesopotamia during the war. Twelve gunboats of this design were built and sixteen of a smaller type were also designed and constructed by Messrs. Yarrow & Co. All the shallow draft river gunboats constructed during the war were designed and built under the supervision of Messrs. Yarrow & Co. Although this model illustrates a gunboat, the type is equally suitable as a passenger or cargo steamer.

On certain rivers it is found that the stern paddle wheel gives excellent results. As example of a shallow draft vessel so propelled, by this means, is shown in a separate model of the *Mosquito* and *Herald*. This type of vessel lends itself admirably to the employment of unskilled or native labor owing to its extreme simplicity.

A model is shown of a small shallow draft steamer (Yarrow type) 75-ft. long, of which a large number have been built for different parts of the world.

A model is also shown of the fastest destroyer in the world, H.M.S. *Tyrian* designed and constructed by Messrs. Yarrow & Co. and which obtained a speed of 40 knots. This is of particular interest in view of the important part high speed destroyers took in the recent war.

4. John I. Thornycroft & Co., Ltd.

JOHN I. Thornycroft & Co., Limited will be exhibiting in two sections of the palace of engineering, while other examples of their productions will be on view elsewhere, brief particulars of which follow :

1.—“Palace of Engineering” (Mechanical Engineering Section), Stand No. 141.

The space allotted is quite inadequate to enable anything like a fully representative display of their productions to be made, but there will be on view at this stand a representative range of Thornycroft marine engines suitable for different types of craft, many hundreds of which are in service throughout the world.

Similar engines equipped for stationary use as lighting, pumping, salvage or portable power sets, will also be on view also examples of Thornycroft propellers and oil fuel apparatus. Even more attractive will be the exhibits of models representing different types of river and sea-going boats they have built, ranging from small river craft to cargo vessels, oil tankers and torpedo-boat destroyers.

2.—“Palace of Engineering” (Motor Transport Section), Stand No. 35.

Here amongst the collective exhibit of the Society of Motor Manufacturers and Traders will be displayed a Thornycroft type “Q” 5-ton tank wagon suitable for the transport of motor spirit for the Anglo-American Oil Co. Limitations of space will only permit of this one example from the wide range of Thornycroft motor vehicles now supplied for loads from 2 to 11 tons for the transport of goods, also vehicles for passenger or municipal service. It has, however, been arranged for this exhibit to be changed from time to time to permit other Thornycroft vehicles to be shown during the period of the exhibition.

Elsewhere in the exhibition buildings and grounds there will be many other examples of Thornycroft productions deserving of the attention of visitors to whom these are of interest. Brief particulars are as follow :

3.—At a special pavilion alongside the *India Pavilion* will be exhibited a 38-ft. motor boat constructed entirely of India and Burma timbers, for the express purpose of demonstrating the resources of these countries for timber suitable for such work. The construction of this was entrusted by the authorities to John I. Thornycroft & Company, Limited, who have given very special

attention to the choice of these timbers, which provide not only the strongest and most durable but also the most attractive and decorative which the world can supply. The hull of the boat is constructed entirely of Burma teak, each plank being in one length from end to end, in top sides. The coamings, hatchways and deck house are of Andaman paudauk, and the interior woodwork is, in the aft cabin, in laurel wood, and in the fore cabin in silver greywood. The Indian laurel wood, paudauk and silver greywood, was supplied by the government of India, and the teak by the government of Burma, through the sole agents for the sale of timber for both governments, Messrs. W. W. Howard Brothers & Company. This boat has been fitted out for private cruising and is of a type also suitable for port officers, customs, pilot or similar service.

It is fitted with a Thornycroft type DB/2 9 b.h.p. motor, the high efficiency of which renders it of ample power for such a large boat, while its low fuel consumption is a considerable advantage for overseas service.

4.—The *Department of Tropical Hygiene exhibit in the British Government Pavilion* will include two models of motor vessels constructed by Thornycroft's for red cross and hospital service; one of the famous hospital ship *Nabha* presented by the Maharajah of Nabha for war service in Mesopotamia, and a model of a 50-ft. boat completely equipped with stretcher racks, cots, isolation ward and medical staff accommodation, representing a type of boat of particular interest to medical officers abroad.

5.—On the ornamental water which will be one of the attractions of the exhibition grounds, a fleet of 30 passenger boats, capable of accommodating 18/20 persons, will be running and no doubt in very great demand. Their conditions of service necessitated a special type of boat, for which tenders and designs were invited from a large number of builders in the United Kingdom, and eventually they were entrusted to Messrs. Thornycroft whose design was considered to be by far the most suitable, while their extensive resources will ensure the fleet being completed in good time for the exhibition. In view of the restricted space and special conditions, the boats are to be equipped with electric motors.

All these boats are floored throughout with Indian gurjunwood. One of them which is being specially fitted out for the use of distinguished visitors to the exhibition, is being planked with specially selected Burma mahogany, and fitted with selected poon from Madras.

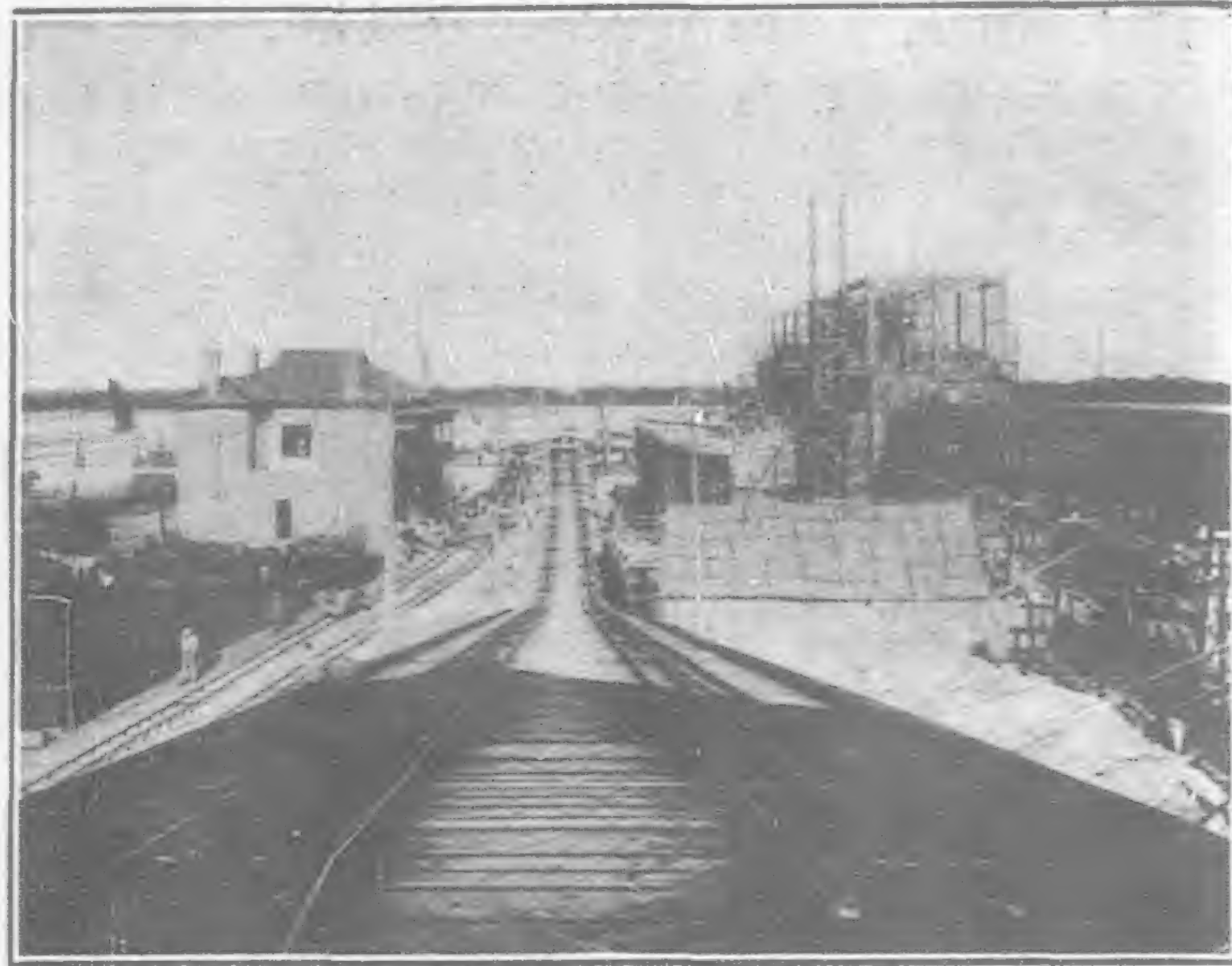
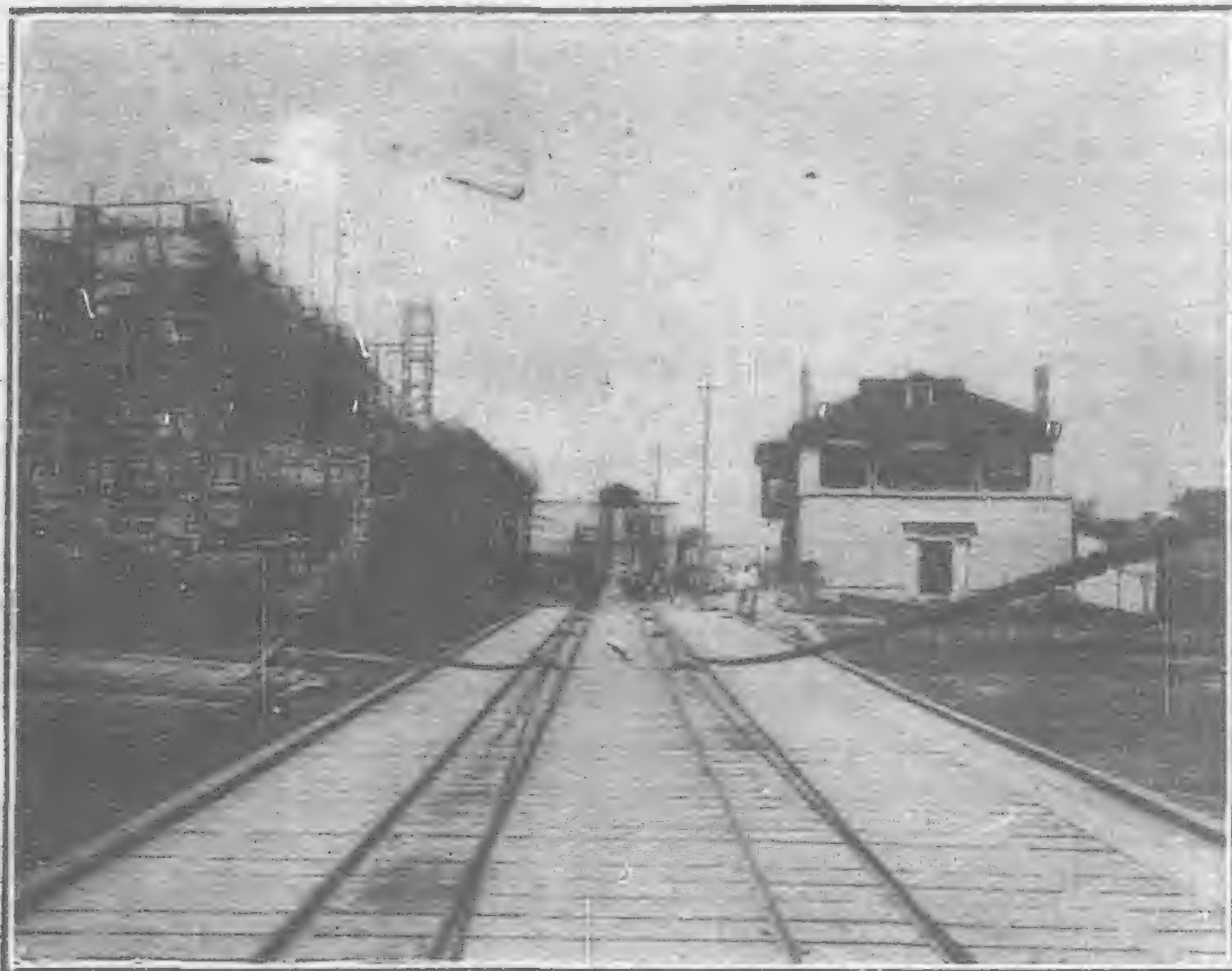
6.—A further example of Messrs. Thornycroft's work will be on view at Messrs. Dorman, Long & Company's stand No. 43, in the palace of engineering, at which the flooring will be in the form of a ship's decking. This has been specially selected and prepared from the round teak logs imported by the government of Burma, and is of the very best quality shipped from Rangoon, and commonly called Moulmein teak, representing a specially fine example of a ship's deck.

Haiho Bridge Tenders

The Haiho Conservancy Commission received 31 tenders for the bridge across the Haiho and it is expected that the award will be announced in a few days. This bridge will be placed to the west of the present bridge and form a continuation of the Rue de France. It is understood that most of the tenders were for a bridge of the bascule type with two moveable spans which meet in the center when lowered and yet permit the passage of all craft that now use the river when the spans are raised. The width of the bridge is specified at 40 feet and the time of completion before the end of next year.



One of the Thornycroft Stands at the British Empire Exhibition



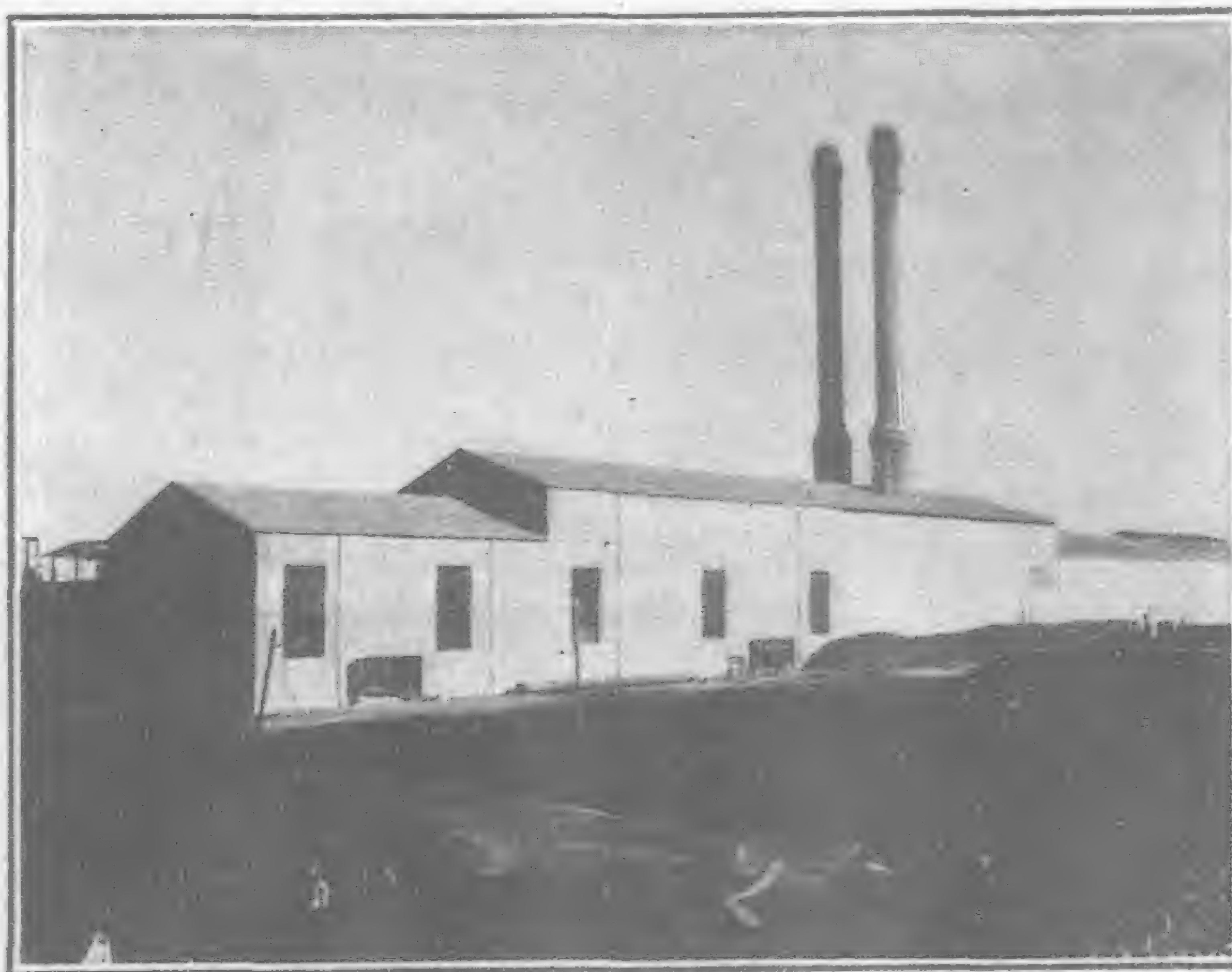
Two Views of the Chain Railway from Wharves to Crusher House

The Shanghai Portland Cement Works

ONE of the most hopeful signs in China is the patriotic efforts of her merchants to develop her resources and industries. During the get-rich-quick excitement of 1920, a group of Shanghai's well-known merchants evolved a scheme for the establishment of a legitimate industry that would meet the growing demands for cement. The promoter was a man of great vision who had the energy and the resources to put his dreams into practical purposes. He realized that to properly develop her industries, China must have cheap coal, and in order to keep pace with modern reinforced concrete construction China must also produce more cement. The group of merchants led by this young man, O. S. Lieu, decided in August, 1920 to erect a modern cement plant, the first step towards what is now known as the Shanghai Portland Cement Works, Ltd.

Prospecting Quarries

The promoters secured the services of a technical expert to advise them during the organization and act as Engineer-in-chief of the works after erection. The offer was made to Mr. H. Mollitor, formerly engineer-in-chief of the Hupeh Cement Works, whose excellent record and long residence in China, eminently qualified him for the task. Mr. Mollitor, commissioned by the promoters to locate suitable limestone quarries and clay deposits made extensive reconnaissances in the Provinces of Kiangsu, Chekiang and Anhui and recommended the stone quarry at Chen Wan Li (陳灣裡) at Wuchow, Chekiang, and the clay deposit at Zosé (淞江余山) Sunkiang as best fitted for obtaining the raw materials from which a very high grade of cement could be produced. He, however, recommended against building the factory at or near the quarries for reasons explained elsewhere in this article.



Exterior View of Plant at Lunghua

Organization of the Company

Meanwhile the company was floated with an authorized capital of \$2,000,000 silver and a board of directors was formed composed of the following well-known merchants: Mr. Chu Pao-san, Chairman, Dr. V. K. Li, Mr. Chang Chien, Mr. Chang Char, Mr. Doo Kia-quen, Mr. Hsieh Chung-sang, Mr. Y. L. Chang, Mr. K. E. Yang, Mr. K. S. Jackson Lieu, Mr. Lee Bah-ko, Mr. Zao Veng-hui, Mr. Han Yun-ken, Mr. O. S. Lieu.

Investigation in Europe and America

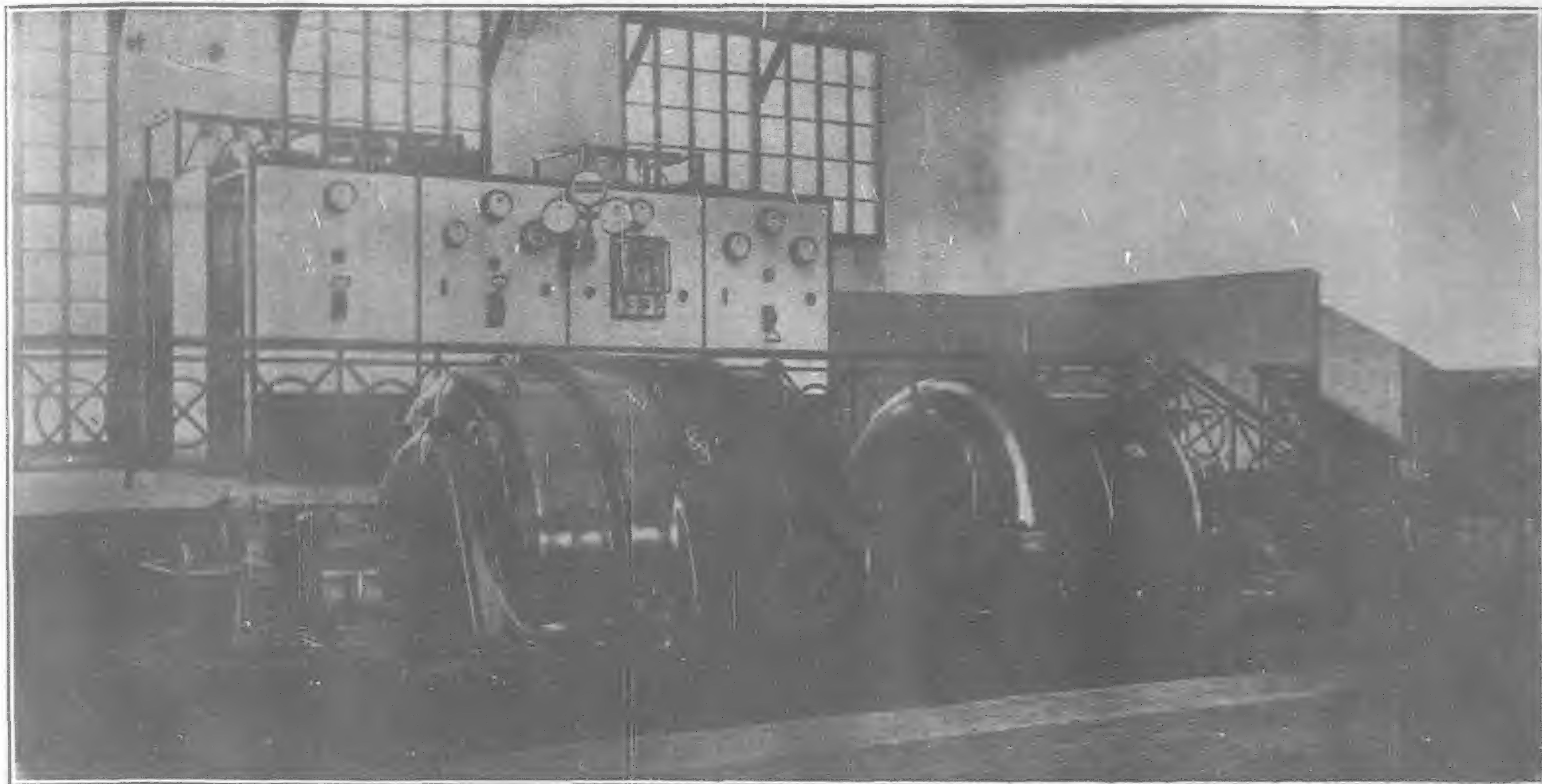
Representatives were sent to Europe and America to study cement manufacture and obtain machinery capable of producing the very highest grade of cement with up-to-date labor saving devices. Mr. H. Mollitor, was deputed to visit Europe, and in England, conferred with Mr. W. H. Brown, A.M.I. Mech. E., leading British authority on cement manufacture. Mr. Brown's advice and Mr. Mollitor's investigations guided the officials of the company in locating the factory site at Shanghai and in selecting the type of machinery to be erected.

The Situation of the Factory

The plant of the Shanghai Portland Cement works, is located on the bank of the Whangpu River three miles above the Kiangnan Dock, and about two miles from the Lunghwa Pagoda. The two tall re-inforced concrete chimneys cast the old familiar Pagoda landmark into a shadow. The factory occupies an area of one hundred and fifty mow of land with right of reclamation to another one hundred mow of riparian land along the Whangpu. The water-frontage acquired at nominal prices measures over one thousand feet; the most valuable asset of the Company.

Selection of Site

1. *Transportation Difficulties.*—To decide upon the



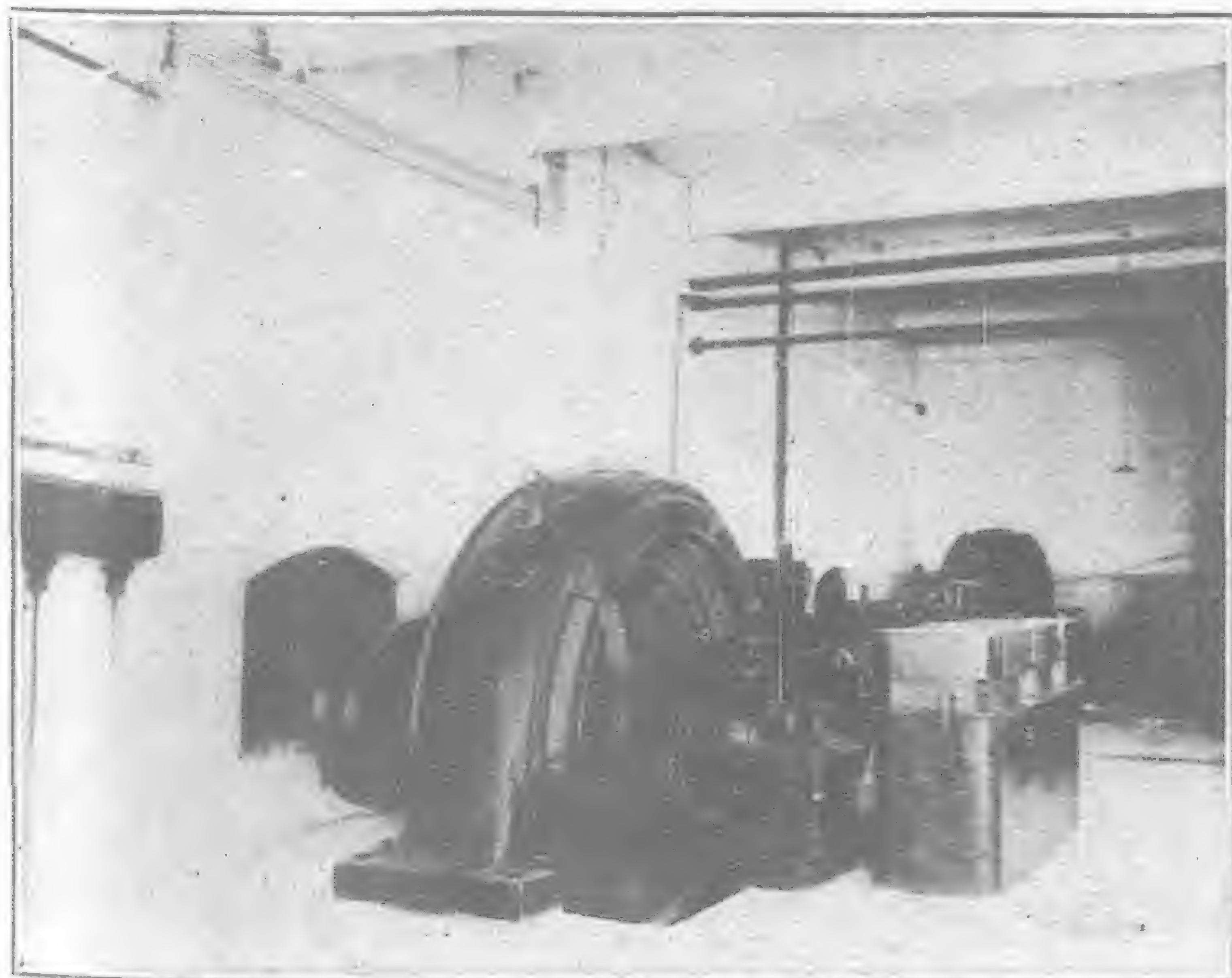
Shanghai Portland Cement Works Power Plant: 2,000 H.P., M.A.N. Turbine Coupled to 1,440 k.w., 50 cycles, 525 volts Siemens Generator

site for a cement factory, the economical transportation of raw materials (limestone, clay and coal) and the finished product must be given serious consideration. To warrant the erection of the factory at the limestone quarries a suitable grade of coal must be found in the same locality with facilities for easy communication with the market and sea-port for the export of the finished product. Such an ideal locality in China is not readily obtainable. Excellent raw materials for the manufacture of cement can be found in many places distant from the marketing centers and shipping ports rendering transportation of coal and finished product difficult and costly. In certain districts limestone and coal deposits are discovered together. But apart from the question of the quality of the coal, the two operations of cement manufacturing and coal mining mean two separate and extensive undertakings. If the advantage of the limestone quarry is alone considered, the coal must be transported to the factory by means of junks, entailing much loss, delay and uncertainty of supply. These difficulties would be repeated and intensified when the finished product is transported to the market, as cement must be transported in covered junks. Even then deterioration and damage will happen through careless handling and climatic changes. The Shanghai Portland

Cement Works obtains its regular supply of limestone and clay from its own quarries in Wuchow and Sungkiang, conveyed by native junks at very reasonable charges and rain or shine the raw materials are daily received in quantities to suit the requirements of production. The works are not handicapped if a boatload of stone or clay turns turtle on the way or the contents are wet with rain nor with a suspension of boat traffic for a spell of one or two months. An immense stock of clay and stone sufficient for ten months consumption is always kept on hand at the works. Coal is landed at the factory wharves direct from Chinwangtao by steamer. These wharves can accommodate steamers of over three thousand tons. Thus the cost of lighterage from coal yard, theft and watering by boatmen on the way to the interior are saved.

2. *Inconsistency of Limestone Quarries.*—Many cement factories in Europe and America had been forced to close down because the quality of the limestone has deteriorated as excavations became deeper. It was then too late to consider the transport of raw materials from other quarries, unless the factory was transplanted to another locality. To provide for this contingency Mr. Mollitor advised against erecting the plant at or near the quarries.

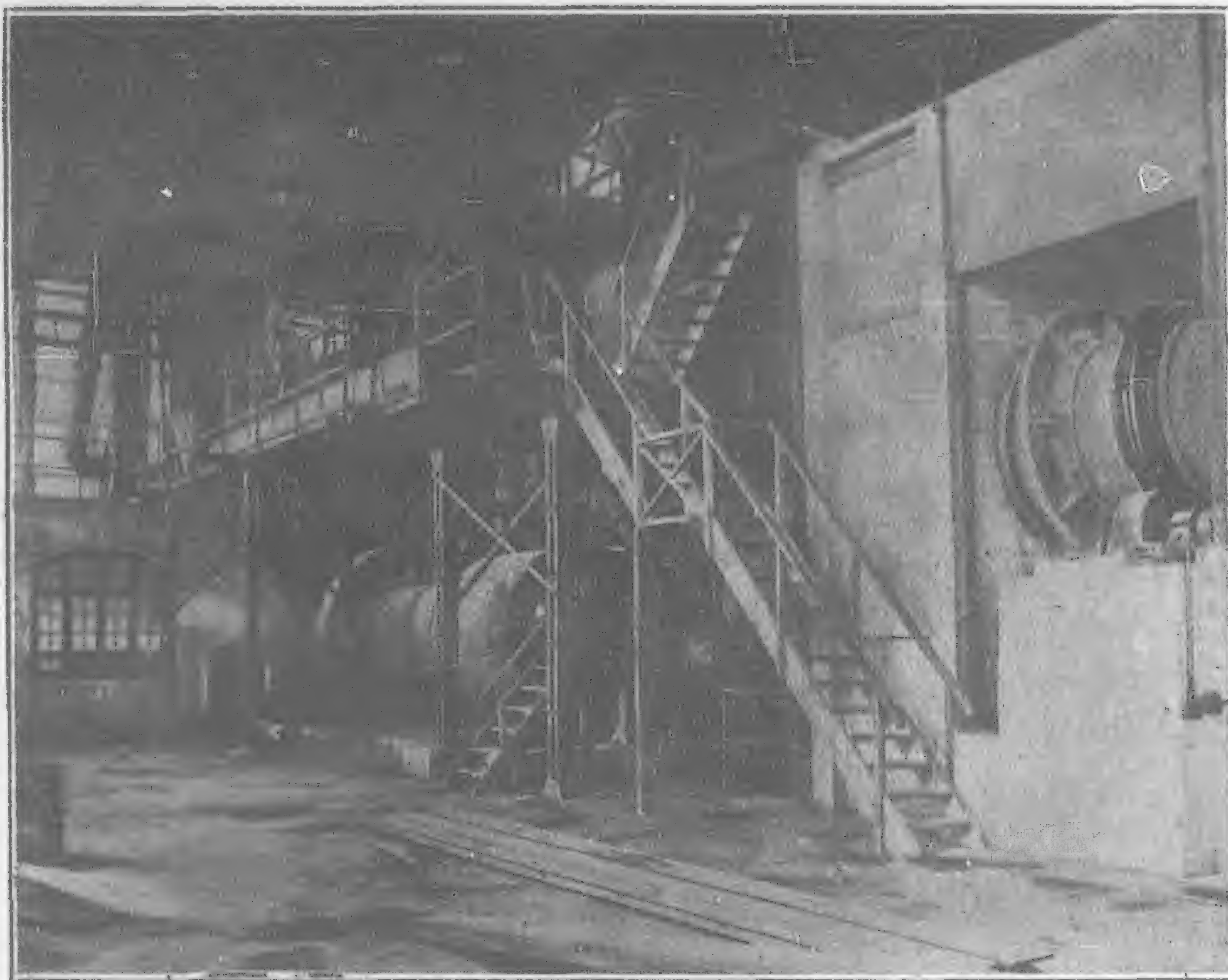
3. *Skilled labour and engineering materials.*—Shanghai is the



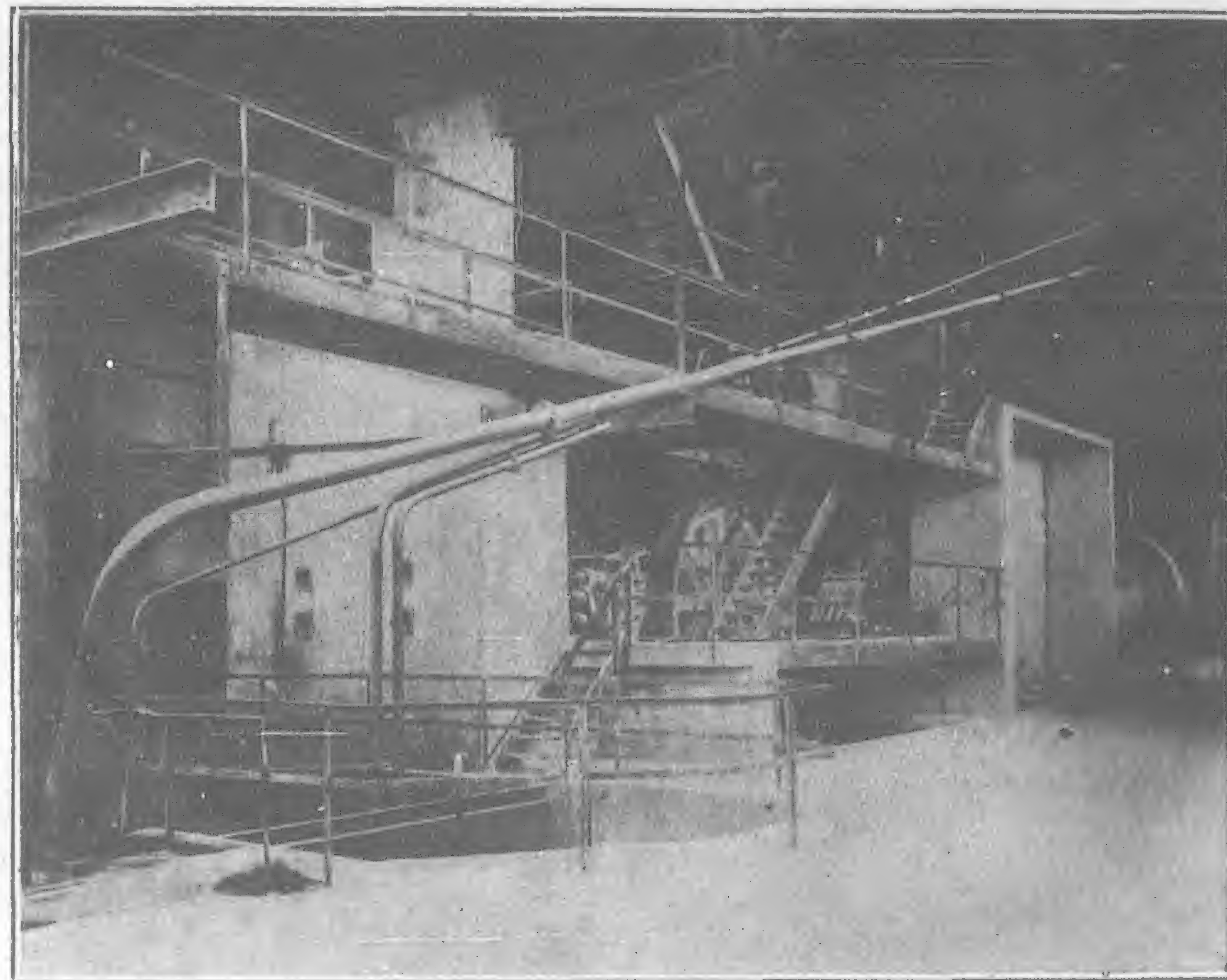
Motor in Crusher House



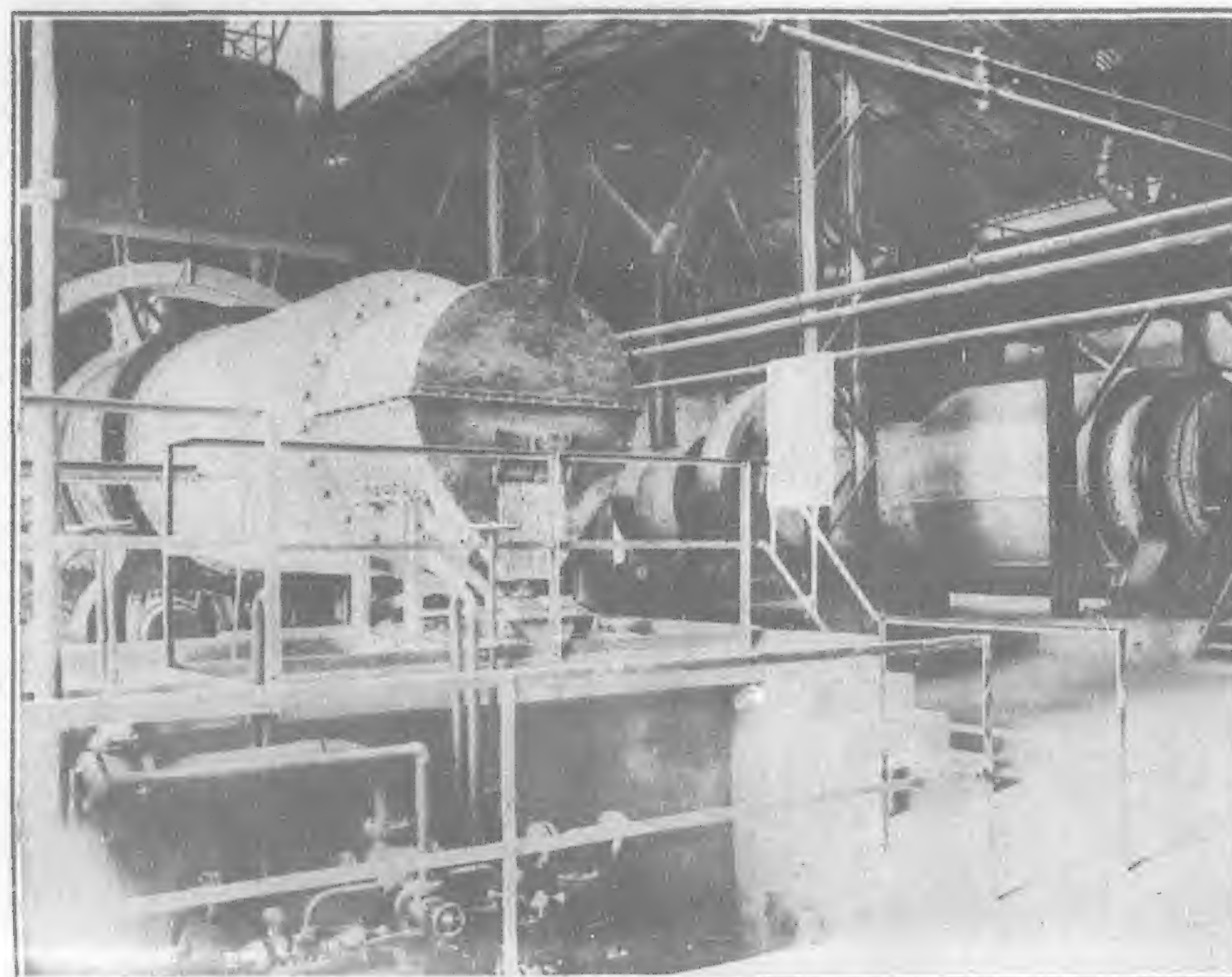
250 H.P. Diesel Engine and Generator



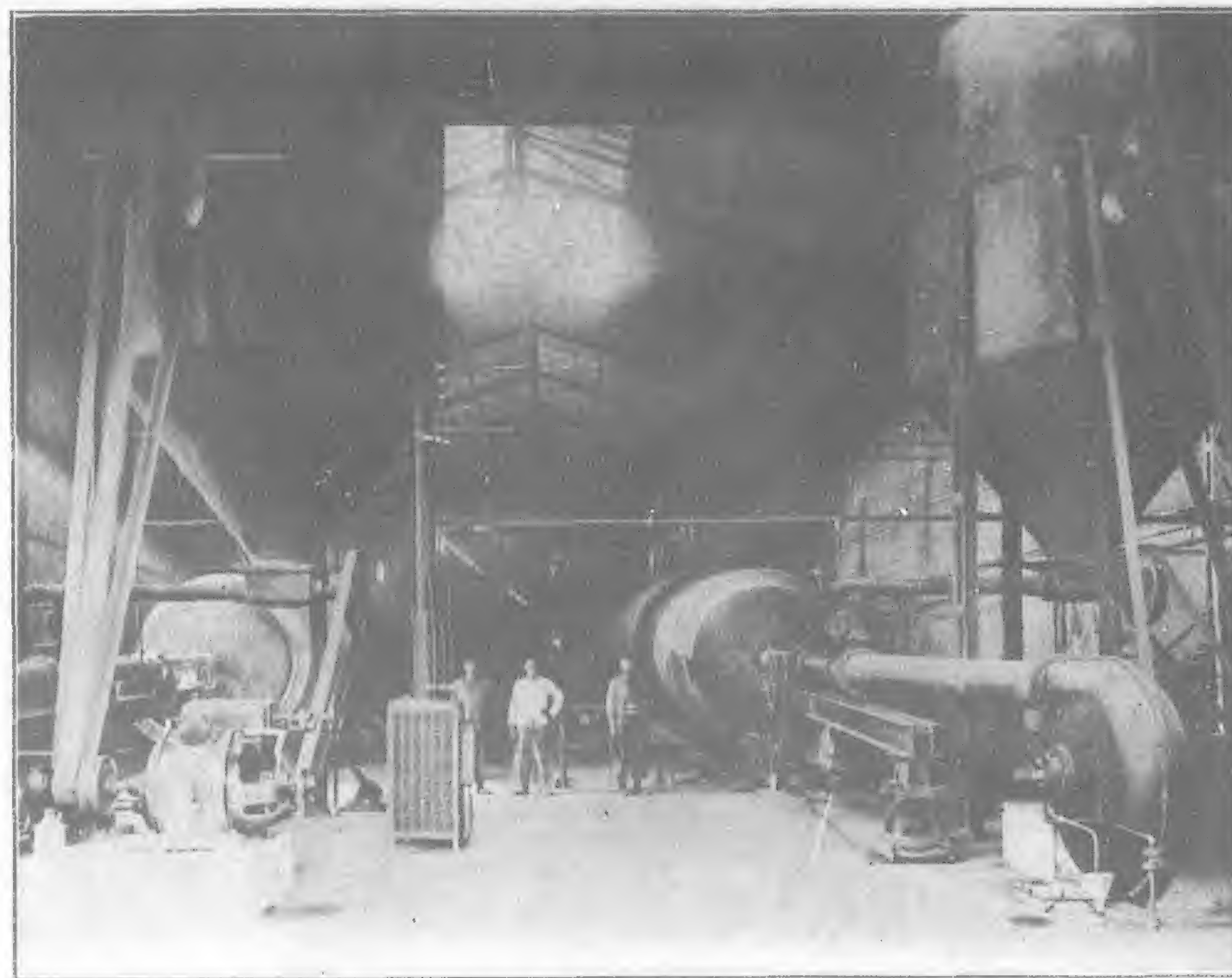
Coal Pulverizing Mill



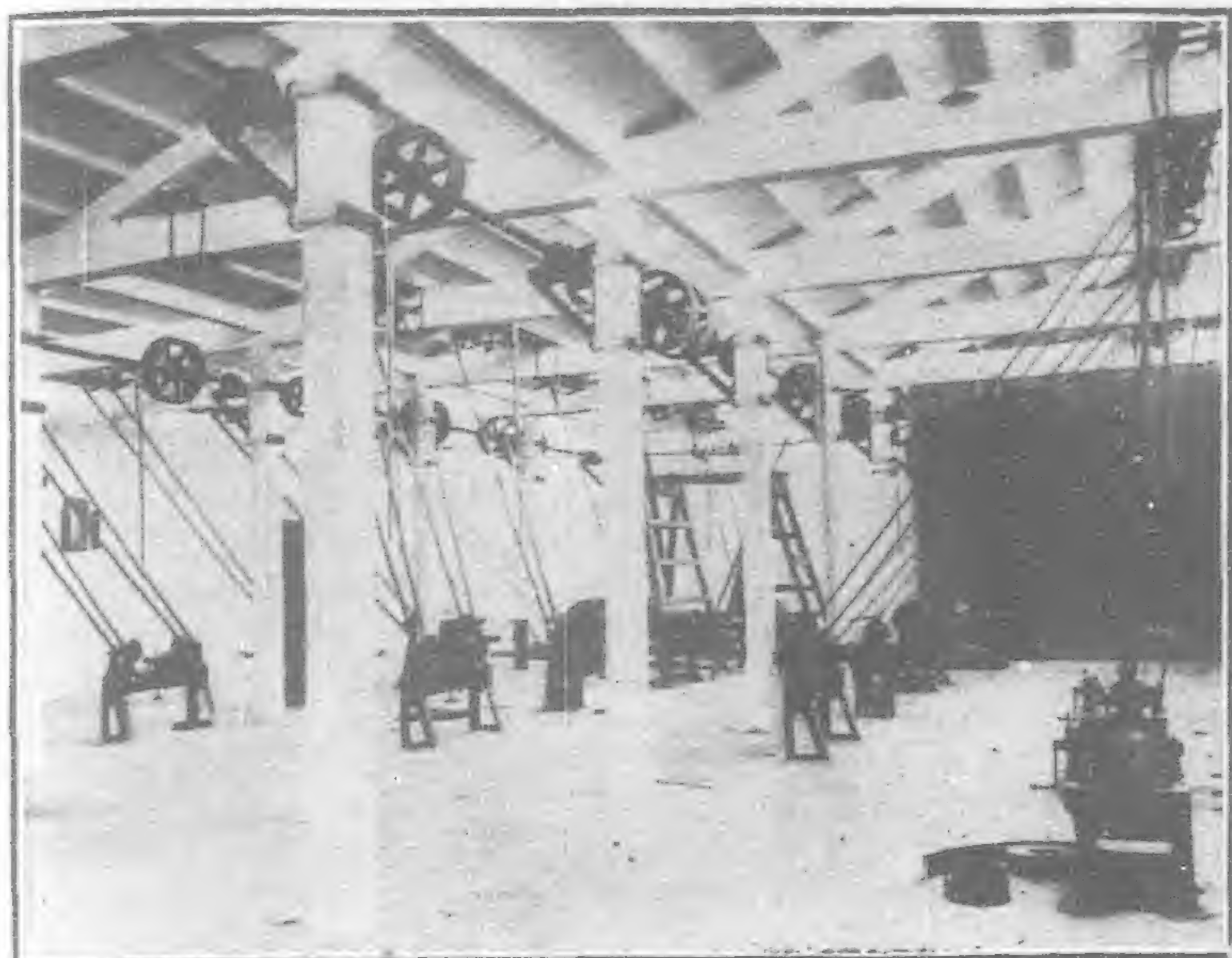
Crusher Above—Rollers Below



Raw Mill—Cement Mill



Rotary Kilns



Barrel Shop

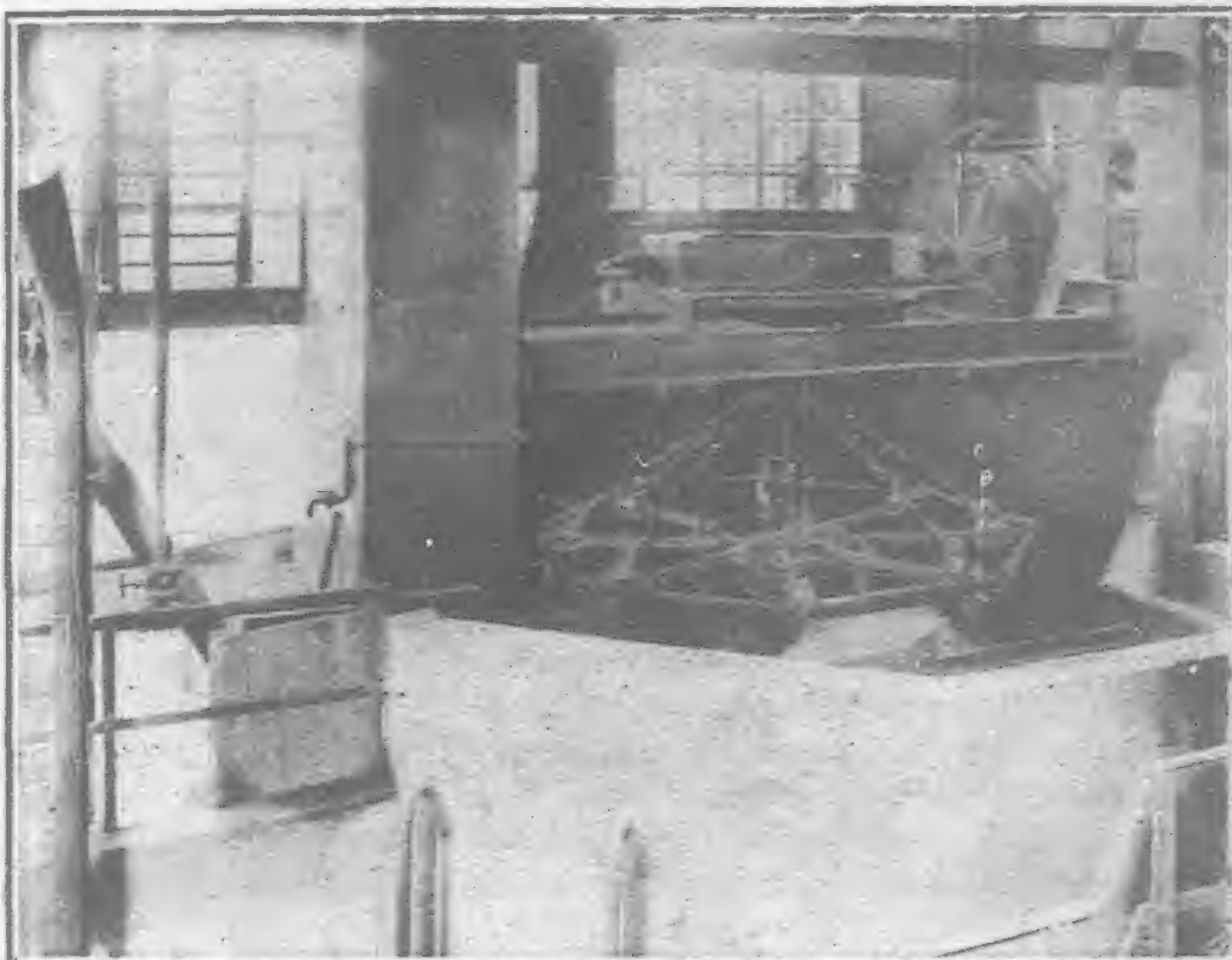
one place in China where skilled labour can be had on short notice. In case of machinery breakdown, repairs can be completed far more expeditiously than elsewhere in China. Nor is it necessary to keep in stock a large supply of engineering materials thus saving a large amount of capital being tied up.

The Purchase of Machinery in Europe

In the choice of machinery for the new enterprise the directors accepted the plans submitted by Messrs. G. Polysius of Dessau, Germany, who manufacture cement machinery exclusively. This same firm equipped the Holderbank Factory of Switzerland in 1913, acknowledged by experts as one of the best in the world. In design and construction the machinery of the Shanghai Portland Cement Works is claimed to be even superior to the Holderbank installation.

Description of the Cement Plant

The plant is one homogeneous unit. The process of manufacture commences with the discharge of raw materials at the wharf fitted with electrically operated cranes for lifting limestone and clay from the junks. The stone and clay are hauled in tipping wagons up a chain railway, also electrically operated, into the crusher house. The cars are dumped, the stone falling into a mechanically working feeding grate which carries the stone into the crusher. From there the crushed stones pass into a roller mill from where the sized stones are conveyed by slanting elevators to the large bin situated above the raw material grinding mill. The clay carried up by the chain railway is dumped into the wash mill. The washed clay flows into what is called "the Pressors" which convey or press the clay by means of compressed air which is manufactured in another department, into another bin also situated above the raw material grinding mill. Both the sized stones and the washed clay are now fed by special feeding devices into the raw material grinding mill. The raw material grinding mill is a compound mill, called "Solo Mill," having two compartments to contain steel balls and

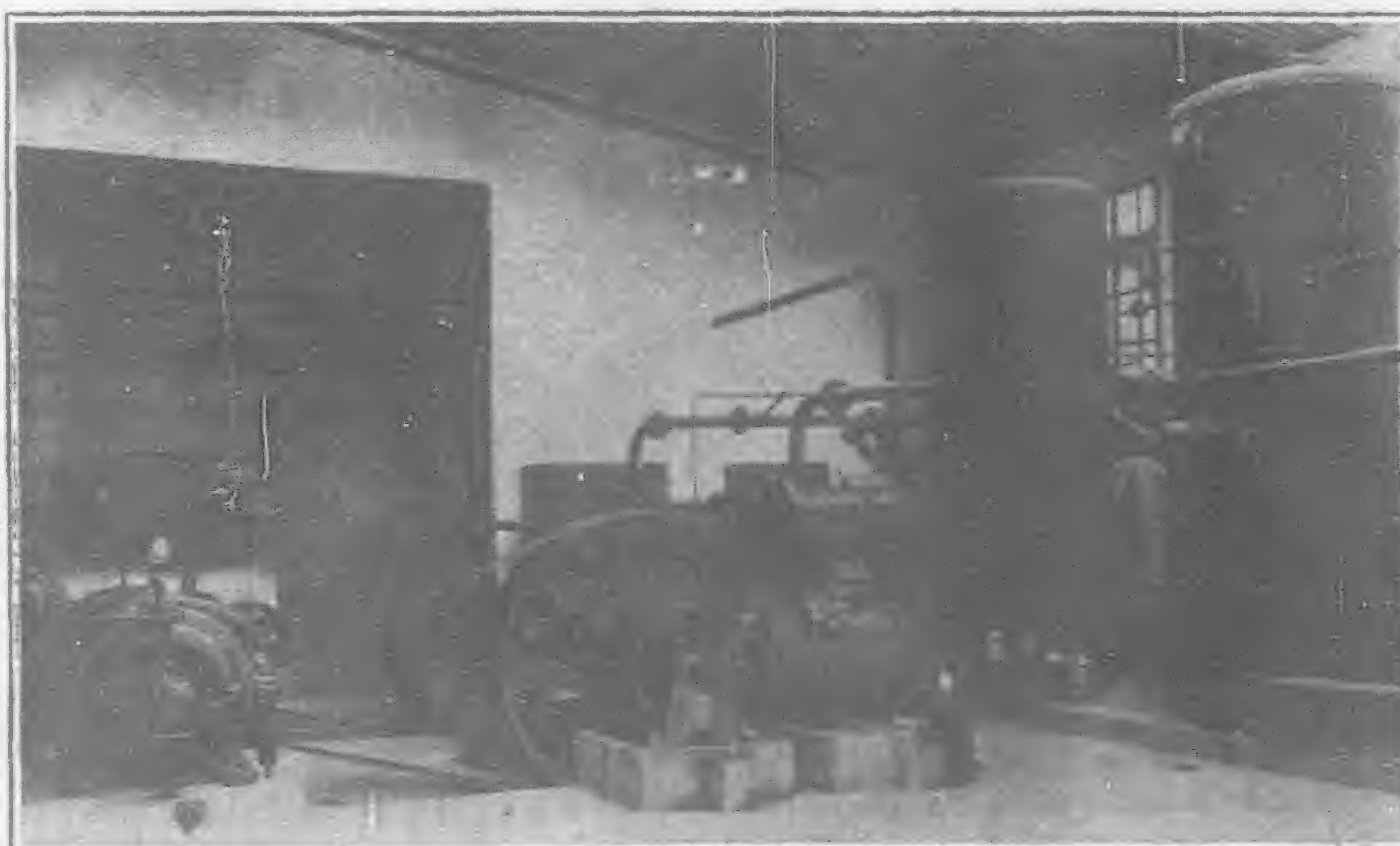


Clay Wash Mill

flint stones respectively by which clay and stone are ground into fine slurry. The slurry flows into the pressors and is forced by compressed air into three separate tanks capable of holding four hundred tons each of the mixture. The functions of these tanks are for storage and for regulating the mixture so that a constant uniformity of the materials for production is obtained. The work of regulating or mixing the contents of the tanks is done by means of compressed air. This branch of work is in charge of the laboratory. The slurry having been consistently mixed it flows into another set of pressors and transmitted to the bins situated above the rotary kilns. By a special feeder the slurry is fed into the kilns. The kilns of the Shanghai Portland Cement Works are of a special type and design, having an enlarged sintering zone and the whole length of the Kiln is erected on floor level. This feature is especially interesting inasmuch as the Kiln of all other makes are erected on very high foundations in order to allow the cooling drums to be installed underneath them. Whereas the cooling drums of the Kilns of this Factory are attached to the ends which is the latest improvement. The slurry fed into these kilns is burned with pulverized coal, producing a heat of 1,500 degrees Celsius by which process clinker is formed. The clinker when cooled down in the attached cooling drums at the end of the kilns is conveyed to the clinker hall by means of shaking conveyors and elevators, going through at the same time an automatic weighing scale which registers the amount of production of each kiln. The Clinker Hall of this Factory has a storage capacity of 15,000 tons.

The coal required for the kilns for the production of clinker is pulverized and the process of pulverization is a separate process. The coal is carried into a grate receptacle and fed into an elevator

which conveys it into an automatic weighing machine and is registered. From there it is sent into a bin above the drying drum which is heated with a special fire. The dried coal is sent to another bin from which the grinding mill is fed. This mill grinds the coal into very fine powder. The coal powder is conveyed, by elevators and worms, into storage bins above the kilns. This is fed into the kilns by high pressure fans which blow it into the sintering zone where it is exploded by the surrounding heat in the kiln. The



Air Compressor Room

quantity of coal powder to be fed into the kiln is controlled and registered by special mechanical devices

The clinker stored in the clinker hall is sent to the cement mill by shaking conveyors installed in the tunnel under the clinker hall. The conveyors receive the clinker from the clinker hall through special trap devices and it is carried up by an elevator and sent to a storage bin above the cement mill. Prior to the clinker entering the bin gypsum is added to it for the purpose of regulating the setting of the ground cement. For this purpose a gypsum crushing and distributing plant is installed between the clinker hall and the cement mill. The quantity of gypsum to be added varies according to the temper of the clinker and it is therefore regulated by the Laboratory. When the clinker is sent to the cement mill by a special feeder the setting time of the cement to be produced is already determined. The cement mill is exactly similar in construction to the raw material grinding mill, namely a compound mill containing steel balls and flint stone with which the clinker is ground into fine cement. This is one of the most important sections of the factory, for the fineness of the cement depends upon the serviceability of the cement mill. Any cement mill will grind and grind the clinker to high fineness, but the problem is, will a cement mill grind to required fineness and required quantity per day's output at the same time? The cement mill loses its function when it produces quality at the expense of quantity or vice versa. This is the point that some of the new cement factories have overlooked when ordering their machinery and this problem is facing them seriously to-day. When a cement mill is not efficient either quality or quantity must be sacrificed. The choice is of course whether the buyers or the manufacturers shall be the ultimate sufferers.

When the cement is ground it is sent to a special cement store or cement silos. It is conveyed from the mill by an elevator to the worm conveyors of about 82 metres in length. These conveyors feed the cement into an automatic weighing machine and from thence the cement is sent to the silos. The capacity of the silos of this factory is 25,000 barrels. Below each silo an automatic packing machine is installed. There are two barrel packing and three bag packing machines being provided. These machines are capable of filling 2,000 barrels and 3,000 bags in a day.

To prevent waste, the cement and coal mills are provided with dust collectors of special device called Beth filters. The dust thus collected is returned to the respective mills. For arresting the fine materials being blown out of the chimneys from the kilns, the smoke chambers situated between the heads of the kilns and the chimneys are provided with special arresting devices whereby all such dust is collected and returned to the slurry. One prominent cement engineer who visited the factory remarked that the works as well as the area around them were surprisingly free from dust!

The Power Plant

The whole factory uses electricity as its motive power. The power plant consists of one 2,000 h.p. M.A.N. turbine coupled with one 1,440 k.w., 50 cycles and 525 volts Siemens generator. The boiler room has an installation of five water tube boilers (Machinen-fabrik Esslingen), each having a heating surface of 204 square metres, with super-heaters, mechanical grate stokers, suction draught plant, economizers, water cleaners and pumps. Coal is fed by electrically operated lifts. The boiler house being elevated the ashes are discharged through hoppers into the room below from where they are taken away on cars. There is also a Diesel generator of 80 k.w. to provide current for light and power during holidays. The factory has its own water installation. All the units of the factory are driven separately by electric motors.

The Barrel Shop

The factory has its own barrel shop capable of turning out 1,500 barrels per day. A complete set of machinery for the purpose has been installed. For consumers who prefer iron drums a set of drum making machinery and a welding plant are ready to meet requirements.

The Laboratory

A complete and up-to-date laboratory with highly trained European and Chinese experts controls the quality of the cement produced in the factory. The laboratory is equipped with apparatus for tensile, compression and chemical tests. Every ingredient that

has to go to the factory for the manufacture of cement is first passed through the laboratory and it is accepted or rejected according to the tests. Very careful and painstaking tests are carried out hourly and records made. No cement is sent out to the market that escapes the watchful eye of the laboratory staff, so that the consumers can safely rely upon the quality of every bag or barrel of cement produced in the works the excellence of which the company claim.

General

The building construction of the factory is of modern type. Owing to the nature of the soil the foundations both for the factory itself and the cement silos are of cement block type. A new and interesting feature of the construction was that all machinery was put up before the masonry work. The office buildings, residences for the manager, the engineer-in-chief and the staff are spacious modern buildings. The godown now in process of construction will have a storage capacity of 25,000 barrels. The two jetties for discharging raw materials and coal and also for loading cement are capable of taking care of half a million tons annually. These jetties can berth steamers of over 3,000 tons. The construction of the factory commenced in September, 1922 and was completed on July 18, 1923 on which date the works started to manufacture cement. It took the record time of ten months to complete the whole construction, a fact in which the company take just pride.

The whole factory is built with provisions for extension from 1,400 barrels per day which is the present capacity of output to 2,800 barrels per day. Investigation showed that only seventy-eight workmen are employed in the factory and when one has known other factories of similar nature which employ twelve times the number of labourers, one at once begins to appreciate the modernness of this factory. And this is the factory situated in Shanghai which is sending out daily hundreds of barrels of cement bearing the label of an elephant whose quality the officials claim is equal, if not actually excels, the Holderbank output.

SULZER

BROTHERS

SHANGHAI ENGINEERING OFFICE
No. 4 AVE. EDWARD VII

蘇
爾
士
工
程
事
務
所
上
海
愛
多
亞
路
四
號



目錄及關於工業上之問答等請直接本公司

Airless Injection
Two Cycle Sulzer
Diesel Engines

Uniflow Steam Engines, Upright Watertube Boilers, High and Lowlift Centrifugal Pumps, Fans and Ventilators for all purposes, Fire Engines, STATIONARY DIESEL ENGINES, Direct Reversible Diesel Marine Engines, Ice and Refrigerating Plants, Electro-Boilers, Maag Gears and Maag Gear Planing Machines.

WINTERTHUR, SWITZERLAND.

Cane Sugar and Distilling Industry in Indo-China*

By J. Ruet

THOUGH sugar cane has been grown for ages in Indo-China, sugar making is quite a recent industry which began some fifty years ago and especially developed in Cochin-China and Annam where the total areas covered by cane are 13,000 and 27,000 acres respectively.

The average yearly production has been for the last decade 40,000 tons of Muscovado sugar for all the sugar produced until 1917 was only manufactured by native factories, if we dare call a factory the small wooden mill and other implements used.

The yield per acre is very low and the maximum obtained has been 1.5 ton of sugar; this is firstly due to the cultivation process of the natives who hardly make use of fertilizers the only one being a mixture of chalk and ashes of paddy husks. Secondly the mill which is composed of three vertical wooden cylinders, about three feet high by one foot diameter gives a very poor juice extraction about 45 per cent., which is really nothing when compared with the 98.7 per cent. obtained in Hawaii.

Further the evaporation system consists of three or four cast iron pans on a single furnace in which bagasse or wood is burned. The juice is allowed to remain in these pans for an hour or two after which it is clarified with chalk and goes through the defecation process.

The boilers used are the same pans in which the syrup is stirred in order to help the crystallization and formation of the masse-cuite, which, while still boiling hot is poured over mats in thin layers and allowed to cool. The sugar is then ready to be sold.

Such mills, in spite of their poor efficiency, manufacture an average of 200 kilos per 12 hours and more surprising still give considerable profit.

Two-thirds of the total production of Indo-China is used locally by the natives, the other third is exported to China which shows a great increase in this line if we consider that in 1914 only 2,500 tons were the needs of the Chinese dealers.

To these 40,000 tons of muscovado sugar we must add 1,000 tons of white sugar produced by the Vaico Oriental Factory (Cochin-China) which was erected in 1917; but this quantity is far from being sufficient for the local needs for besides it the colony has to import each year 9,000 tons of white sugar from France, Hongkong and Java.

A new company the "Société Sucrière Franco-Japonaise" has just been incorporated in Saigon for the erection of a factory which is expected to turn out 1,000 tons of white sugar per year, it will be located in the province of Bienhoa (Cochin-China).

All this data sufficiently proves the necessity of building modern factories which not only with a better extraction will increase the actual production by two-thirds, but also with appropriate scientific methods of cultivation will class French Indo-China in a few years time among the world's sugar-producing countries.

Growth of Alcohol Industry

More than thirty years ago a plant was laid down under the name of the Société Française de Distilleries d'Indo-Chine in the

outskirts of Cholon, the industrial part of Saigon, for the purpose of producing alcohol from paddy. The plant occupied just a small area on a marshy piece of land and was due to the initiative of a single man, M. Fontaine. When the factory was completed it was capable of an output of 20,000 hectolitres per annum.

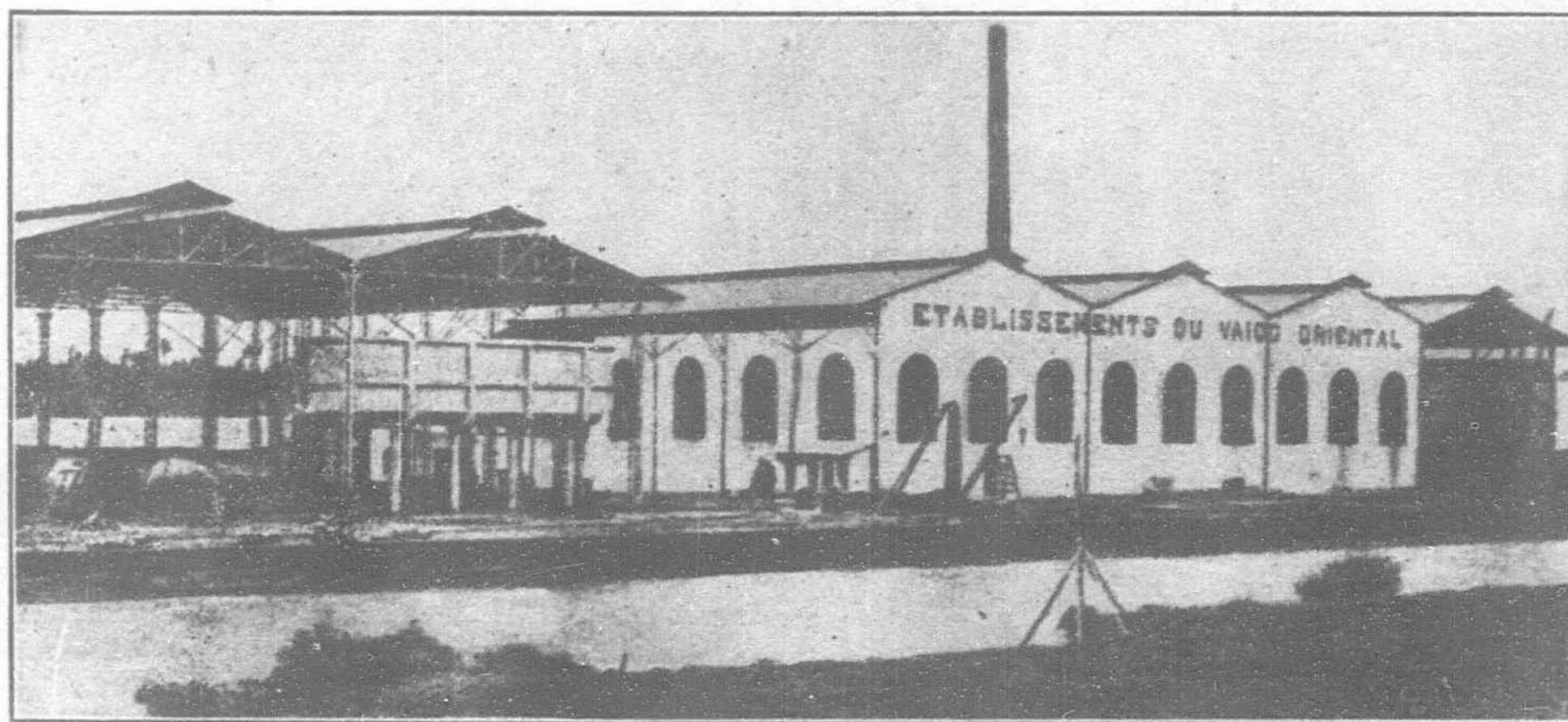
In 1908 the annual output had been increased to 100,000 hectolitres as a result of the addition of new buildings. Up to this time the factory was dependent on the neighboring mills for the supply of the rice required but with this increase it was decided that the factory should have its own rice mill and in 1912 a plant was laid down for the production of the 30,000 tons of rice required. This was built on the most modern principles and was a vast improvement on the other mills of the district whose building dated some twenty

years back. These improvements were completed before the outbreak of war and so it happened that in spite of the reduced tonnage available for freight the company was able to send to France over 100,000 hectolitres of alcohol and vast quantities of acetone for use in the making of explosives and for the aircraft trade. This was in addition to the production turned out for local consumption.

Not the least interesting point in the growth of this factory is

the fact that it has become more and more self-contained and has contrived to make use of its by-products to the utmost limits. It is significant that only one commodity enters the factory and this is the unhulled rice or paddy brought straight from the producers. The waste product after the rice has been milled is made use of for heating the boilers of the steam engines and these engines furnish the power for the electric motors driving all the machinery of the plant. The rice once milled is turned over to the distillation process and to the plants treating the by-products. In 1921 new buildings were again started and have now been completed for making further use of these. One of the new buildings and plant is for the purpose of obtaining the oil contained and to make soap which will be a new source of prosperity for the company. Another is for the production of concentrated foodstuffs from flour which undergoes fermentation process. It is contemplated that these articles will reach the home market first meeting local needs.

All the while the plant is extending; laboratories and repair shops have grown up. A new rice mill has just been added capable of producing 300 tons daily. To give a comprehensive idea of the growth of this factory a few figures will not be amiss. The European staff of chemists, engineers, etc., numbers fifteen, the workmen number eight hundred. Covered sheds over some 20,000 square meters have been built for storage purposes. The production of alcohol has now reached 10,000 litres per day. In reviewing the growth of this industry which from such small beginnings has now reached to such prosperity one cannot help admiring the spirit of enterprise and perseverance which has animated the founders of the company. In conclusion it is a pleasure to note that the laboratories of the plant have been studying the terrible scourge of beriberi and that the new food products we have spoken of will be a useful remedy against the ravages of this terrible disease.



The Vaico Oriental Sugar Factory at Cholon, Cochin-China

*Information de l'Extreme Orient.

New Hongkong Hotel

WE reproduce from *The Hongkong Telegraph* the sketch of a large modern hotel which it is proposed to erect on the Praya, on the corner of Morrison Street—an establishment which is intended to cater for tourists and others passing through the colony and visiting Canton and Macao. This new hotel, to be known as "Empress Hotel" and which will be one of the most elaborately fitted and equipped hotels in the Far East, has been purposely located adjacent to the wharves of the Canton and Macao steamboats and, as will be found detailed below, will be replete with every comfort and necessity attractive to hotel patrons. Standing on a site of 8,000 square feet, and having frontages of Des Voeux Road and the Praya, as well as on Morrison Street, the new building will be seven stories high, and will be a predominating landmark on the waterfront.

The height of the building will be 105 feet to the level of the roof garden and it will contain 140 bedrooms and 60 bathrooms. On the ground floor will be situated the public lounge, shops and a garage, whilst the first floor will be totally occupied by a spacious dining room (with table and seating accommodation for over 200 diners) and ball room, together with the necessary ante-rooms and service arrangements. Modern kitchens and pantries will be situated on mezzanine floors at the rear of the building. The plan has been so arranged that the dining room and ball-room will have direct ceiling light through artistic leaded glass domes at the second floor level.

It is the interior decorations that will make the lounge, dining room and ballroom distinctive and noteworthy. The decorations of the lounge will be carried out in fibrous plaster in Neo-Greek style, with electric standards and chandeliers to harmonise. The floor of the lounge

will be of Italian marble, as will also be the grand staircase from the ground floor to the dining and ball rooms. The dining room will be in modern English Renaissance style with wall panels of tapestry—reproductions of famous English masterpieces. The whole scheme of walls and ceiling will be carried out in fibrous plaster. The ball room will be somewhat similar in character, with Chinese mural scrolls taking the place of the tapestries in the dining room. The floors of both rooms will be of parquet teak wood and blackwood, the furnishings and lighting equipment being of outstanding character.

The five top floors are given over entirely to single and double bedrooms, etc., these being of typical modern American design. Modern sanitary arrangements will be fitted throughout the building. Regarding the roof garden, an effort is being made to provide

very attractive addition to the hotel's amenities. On every bedroom floor will be situated service pantries and offices, the upper floors of the building being served by three main passenger lifts, a wide stairway and fire escapes.

The windows will be metal casement throughout. Regarding the exterior finish of the building, this will be of granite facing from the ground level to the second floor window sill level, the remainder of the building, with the exception of the main columns, being faced with special matt-surfaced tiles of a pleasing green shade. The structural part of the building will be of reinforced concrete throughout.

Contracts have been signed and the work has already been put in hand, Messrs. Lam, Dore & Co. being the contractors. It is hoped to have the hotel ready for occupation by October, 1925.

We are indebted to Messrs. Palmer and Turner, the architects, for the above sketch and description of the building, which was designed by Mr. A. G. W. Ogilvie, under whose supervision the work is to be carried out.

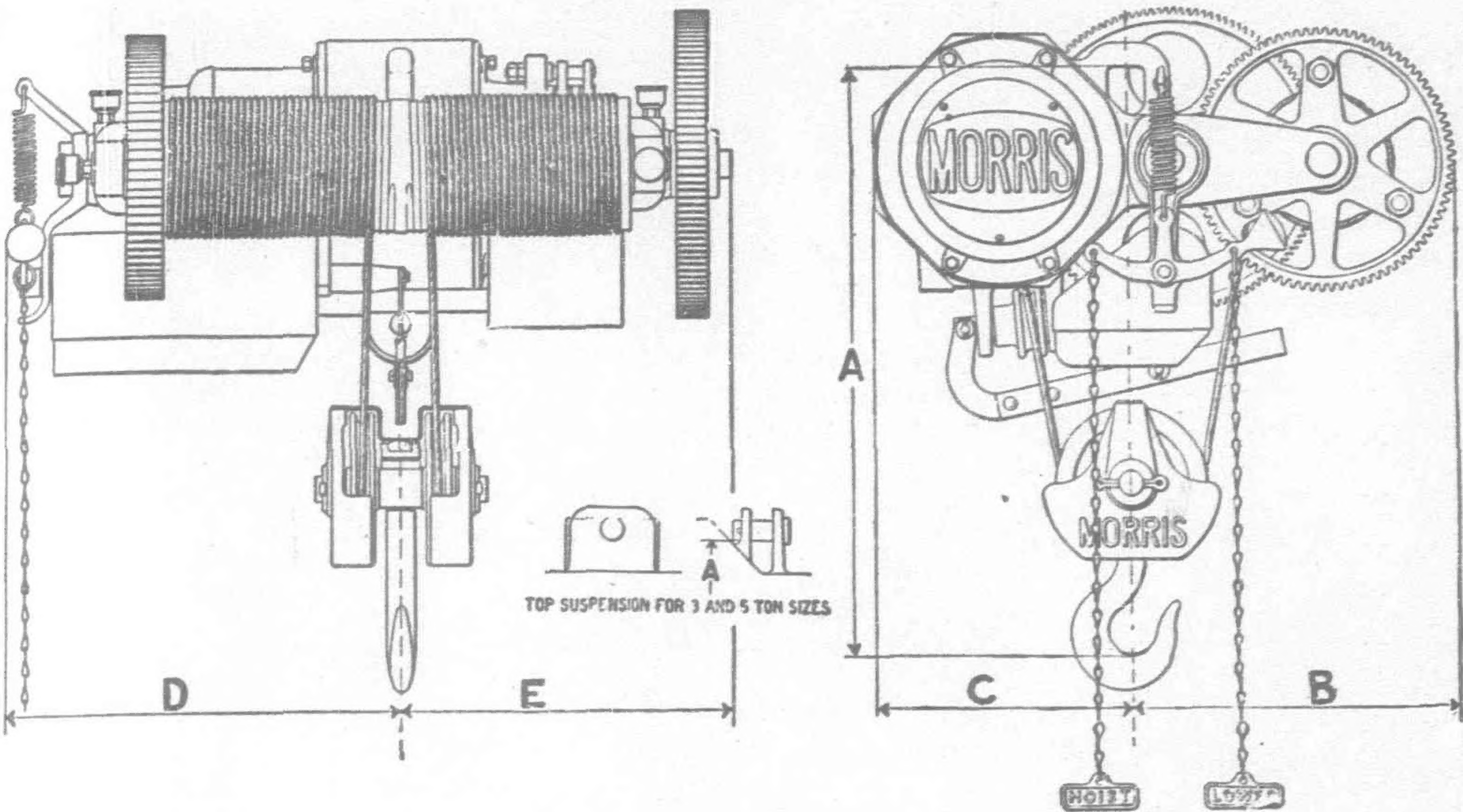


Radio-Phones on S. M. Railway

Technical experts of the South Manchurian Railway are testing out wireless telephone apparatus with the view to applying this means of communication to the operation of trains and to that end are planning installations to be placed at the principal railway stations of the line as well as on the trains themselves. The present plan considers only those stations in the Kwantung Leased Territory since, outside this area, Chinese consent would have to be obtained to such wireless operations, which might be hard to obtain.

Mica Concession Granted

According to Moscow dispatches an agreement has been signed by the Soviet Concessions Committee with A. Grossbard, of New York, representing the International Mica Co. This concession is reported to confer exclusive rights to work the mica beds in the Siberian fields 600 miles north of Irkutsk and covers an area of 240 square miles near the Lena goldfields. Owing to the rapid extension of the electrical industry in which mica is so largely used as an insulator, this concession is considered to be extremely valuable.



GENERAL PARTICULARS

Working Load	$\frac{1}{2}$ Ton	1 Ton	2 Tons	3 Tons	5 Tons
Tested to	$\frac{3}{4}$ Ton	$1\frac{1}{2}$ Tons	3 Tons	$4\frac{1}{2}$ Tons	$7\frac{1}{2}$ Tons
Dimensions	{ A is minimum drawn-up-dimensions The maximum clear lift is 20-ft.	A	1' 3"	1' 11'	2' 3"	2' 8"	3' 2"		
		B	11"	1' 2"	1' 6"	1' 9"	2' 2"		
		C	9"	11"	1' 1"	1' 2"	1' 5"		
		D	11"	1' 5"	1' 6"	1' 11"	1' 11"		
		E	10"	1' 4"	1' 6"	1' 7"	1' 9"		
Hoisting Speed, full load in feet per minute				22	20	20	18	15	

The Morris Electric Hoist-block

THIS high-grade tool built for wear and service and to the highest specifications is, according to its manufacturers, the simplest, most compact and most efficient on the market. The motor is part and parcel of the main frame and the brakes are automatic in action and because of the skilful disposition of the parts are all accessible and easily dismantled. The gears are spur-gears and all machine cut. It is also fool-proof. The magnetic brake sustains the load in any position and the governor automatically prevents acceleration beyond a pre-determined safe limit with any load on the hook. The over-winding switch automatically cuts off the current should the operator negligently attempt to hoist too high. These electric hoist-blocks are invaluable for a number of purposes. They may be used as stationary hoists or hung in trolleys on an overhead runway or crane-girders.

When used entirely as a stationary unit the current can be supplied by means of a flexible cable from some convenient point in the main. If required to

work at different points, wall sockets may be fixed at the selected situations, and the supply cable plugged in where desired.

Working as a traveling hoist-block, the runway or crane-girder is wired, and the trolley fitted with collectors to pick up current in any position. The traveling motion can be by hand or electricity, as required. The motor is totally enclosed, and is specially designed and constructed for hoist duty. When working with A.C. current it is of the slip-ring type.

The controller is of the reversing drum type, also totally enclosed, and fitted with automatic fly-back release and renewable contacts. The frame is a one-piece steel casting, comprising the magnetic circuit of motor, the bearings (brass bushed) of the intermediate shaft, and the drumshaft supports; and is machined to jigs, ensuring accuracy and permanence of alignment.

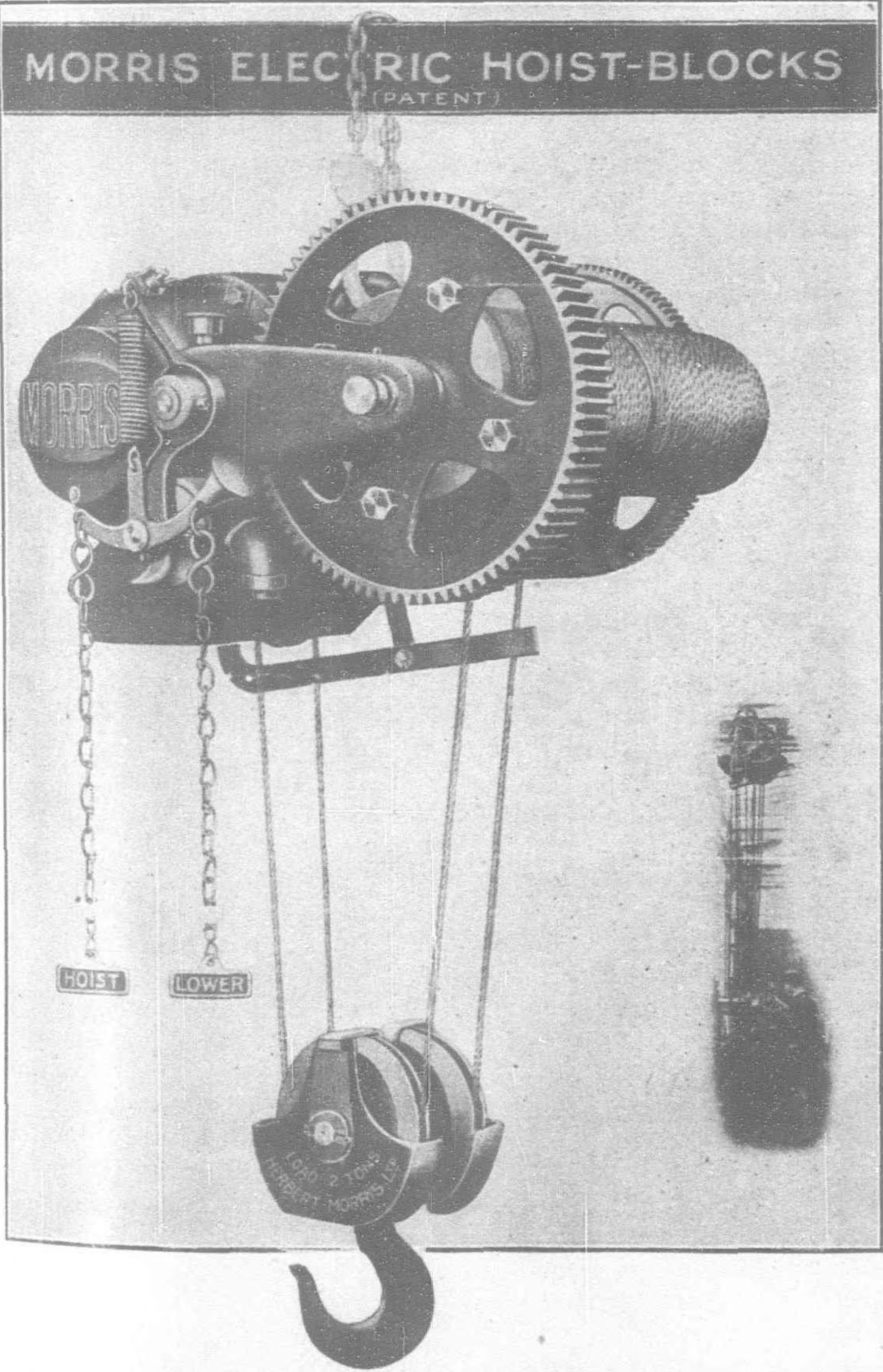
The load is lifted on four parts of best extra-special-flexible plough-steel wire rope working in a grooved drum, giving a truly vertical lift. The hook is a steel forging, and swivels on ball-bearings.

Tunnel Borers Finish Eight Years Work

One of the most difficult engineering feats in Japanese railway construction has just been brought to successful conclusion in the opening of the Orito tunnel on the Aomori-Shimonoseki direct line, the second great trunk railway of Japan. This tunnel is a mile long and has taken eight years of arduous work to bore due to many new engineering problems that constantly had to be solved. Together with the completion of the section between Murakami and Atsumi, this tunnel will shorten the distance between Aomori and Osaka by 150 miles.

It is expected that the entire line will be open for traffic before the end of July and it will constitute not only one of the most useful from a commercial standpoint, but is considered absolutely indispensable from a military one. It has cost nearly Y.100,000,000, but gives a more direct route from the northern to the southern end of Hondo and forming a new connecting link between many important ports and cities of the northern and western districts of the island, serving especially the districts along the shore line.

The tunnel has not been the only difficult bit of engineering on this line, since the Murakami-Atsumi section has called into play all the ingenuity of the construction forces of the northern district. In less than two months the construction forces will turn over the finished section to the operating officials after many years of arduous work.



The construction is simple and compact, and no skill is required for operation

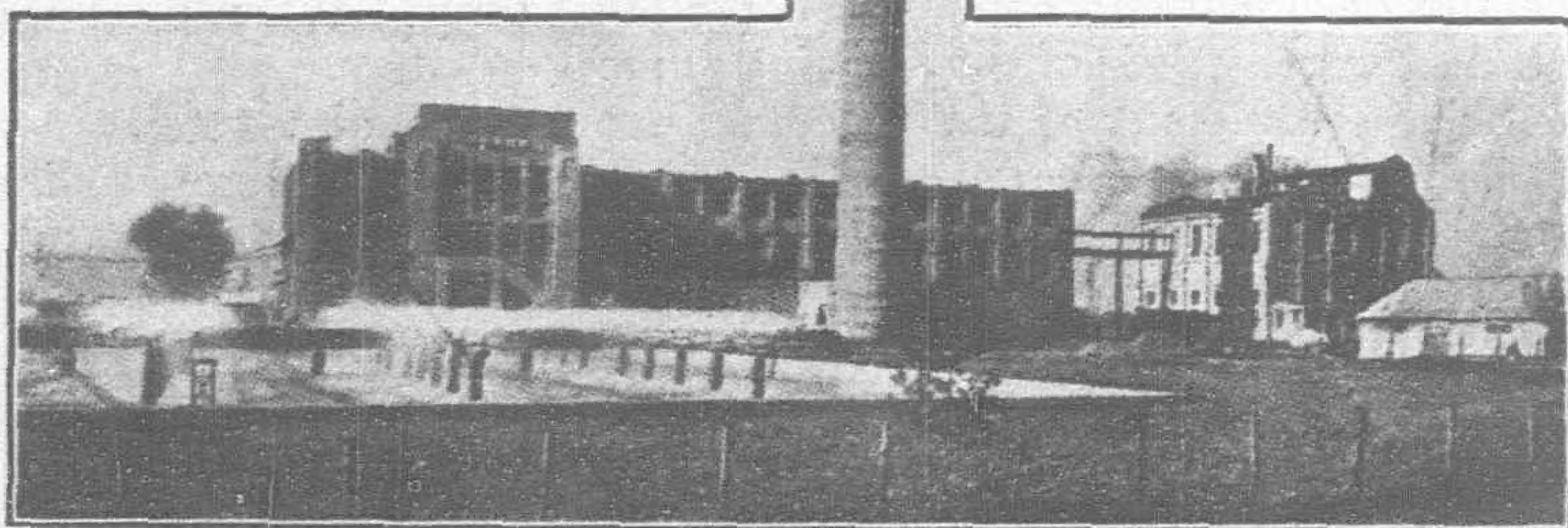
"Spraco" Water Cooling System in China

THE problem of obtaining cool condensed water for power plants in China is being solved through the installation of the Spraco cooling ponds furnished by the Spray Engineering Company of Boston. Amongst the many plants which have this system installed are the following:—

	U. S. g. p. m.
Cheng Chow Textile Mill, Cheng Chow	1,920
Cheng Chow Textile Mill, Cheng Chow	2,880
Cheng Chow Textile Mill, Cheng Chow	2,400
Kirin Electric Light Company, Dalny	1,500
Macao Electric Lighting Co., Ltd., Macao ..	112
Mukden Electric Light Co., Mukden, Manchuria	3,200
Mukden Government Cotton Mill, Mukden, Manchuria	2,560
Taiyuanfu Electric Light Co., Tai Yuanfu ..	800
Tunglioachen Electric Light Works, Mukden, Manchuria	480
Wah Chang Trading Corp., Shanghai	5,200

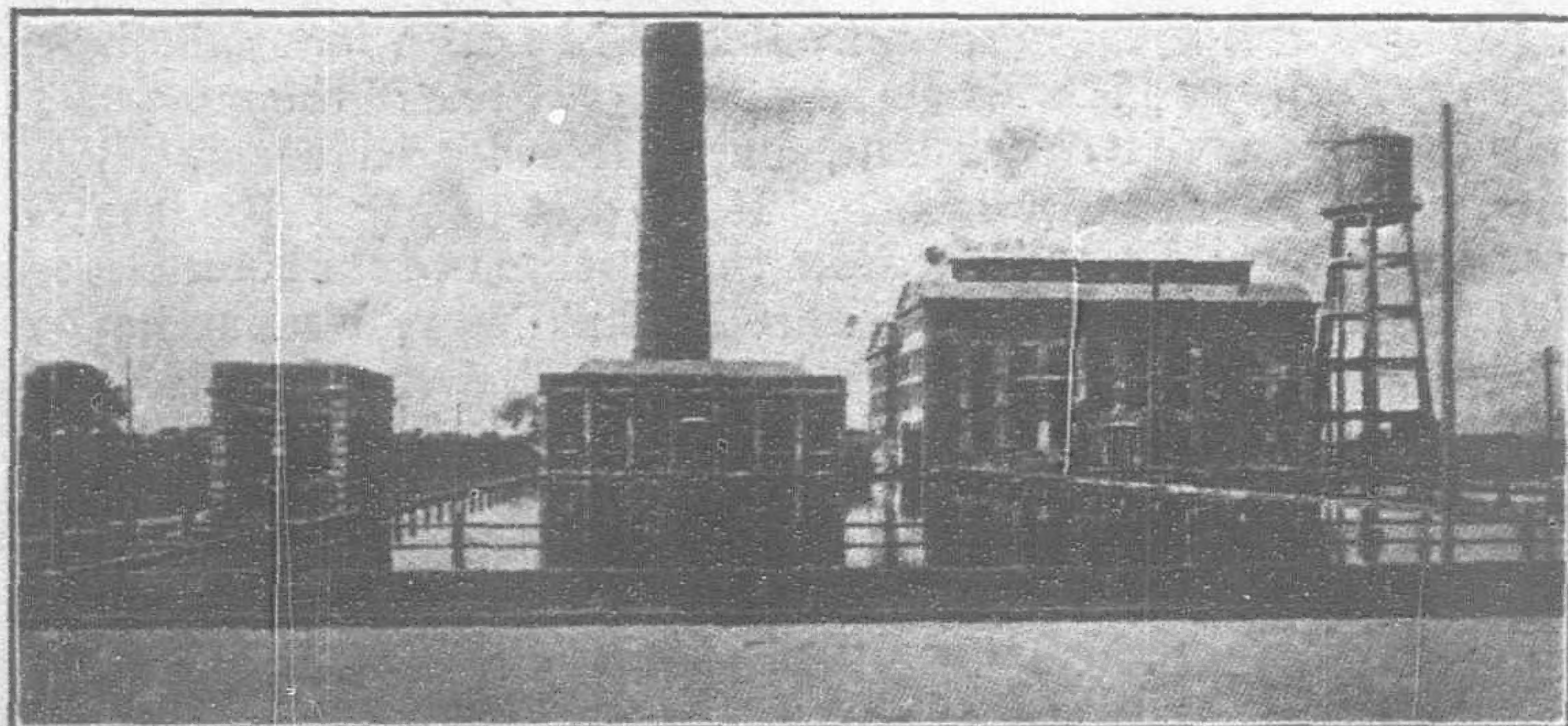
The illustration with the tall chimney is that of new power house of the South Manchuria Railway Co. at Fushun Colliery, Manchuria, showing the Spraco cooling pond in the foreground. This cooling system has a capacity of 24,000 U. S. g. p. m. and provides cool, condensing

water for use in connection with the condenser of a 12,500 k.w. steam turbine generator unit. The size of the concrete basin is 193-ft. by 290-ft. and the system consists of 600-2-in. bronze Spraco centre jet



"Spraco" Cooling Pond at the New Fushun Power House of the S.M.R.

nozzles arranged in groups of five each with complete system of cast iron flanged piping varying from 30-in. down to 4-in. diameter. The total weight of the system is 140,000-lbs. In connection with this system there are two centrifugal pumps each having a capacity of 24,000 U. S. g. p. m. direct connected to 250 h.p. electric motors. The ratio of circulating water to steam condensed is 70 to 1 thereby enabling a vacuum of 28-in. referred to a 30-in. barometer to be maintained when the atmospheric temperature is 80° F. and the relative humidity 60 per cent. This cooling system has proved to be so satisfactory since it was placed in operation about a year and a half ago that similar equipment has been specified for the new power plant of the Anzan Steel Works which is now under



"Spraco" Cooling System at the Dah Shing Cotton Mill, Shikiachwang

consideration. The power plant equipment was purchased and installed by Mitsui & Co., Tokyo, through their New York office.

The second illustration which does not show the entire height of the chimney is the power plant mill buildings of the Dah Shing Cotton Mill, Shia Kai Chong, China. The photograph shows a very large concrete basin especially for the Spraco cooling system, two sections of which not in operation are seen on the right hand side of the illustration. A third section has just been purchased through the Wah Chang Trading Corp., Shanghai, by their New York office having a capacity of 2,600 U. S. g. p. m. making the present capacity 7,800 g. p. m. which is sufficient to take care of 4,000 k.w. of steam turbine generators.

American Trading Company

PERCY H. Jennings, president of the American Trading Co., and William E. Peck, president of William E. Peck & Co., announced recently in New York that a consolidation of the two houses, engaged for years in export and import business, will take place upon ratification by the stockholders of each of a plan of merger proposed by the board of directors and management of each of these companies. The New York corporation will be called the American Trading Co., Inc.

It will have a working capital of about \$5,000,000. The authorized capital stock will be divided into shares as follows: 25,000 shares prior preference (\$100 per 8 per cent. cumulative); 50,000 shares preferred (non-par \$8 non-cumulative); 75,000 shares common (non-par).

The consolidated business of both companies for the year 1923 amounted to approximately \$45,000,000, which is about twice the annual volume of the companies' business for the years preceding the war.

The American Trading Co., the larger of the two companies, has a history dating back to 1857 and its development has been through growth and through consolidation with other long established export and import concerns. It is a pioneer in the export of American manufactured goods and throughout its existence has been one of the foremost in the development of this particular branch of business.

William E. Peck & Co., Inc., was founded by William E. Peck in 1881 and it, too, has grown through individual development and also through consolidation with other well established companies in the same line of business. This company had its origin primarily as a distributor of American manufactured goods in foreign markets and most of the original agencies for American manufacturers are still held by it and form the back-bone of its business to-day.

The board of directors, as proposed for the new company, will include:

George S. Brewster, of New York; Robert S. Brewster, of New York; Mortimer N. Buckner, chairman of the board, the New York Trust Co.; George S. Franklin, of the firm of Cotton & Franklin, New York; Walter S. Franklin, vice-president and secretary of American Trading Co.; Oliver G. Jennings, of New York; Percy H. Jennings, president of American Trading Co.; Hall Park McCullough, of the firm of Stetson, Jennings, Russell & Davis, New York; William E. Peck, president of William E. Peck & Co., Inc., who will become a vice-president of the new company; Gardner B. Perry, vice-president and treasurer of American Trading Co.; Lansing P. Reed, of the firm of Stetson, Jennings, Russell & Davis, New York; Edward M. Sutliff, vice-president of American Trading Co.; Arthur H. Titus, president First Federal Foreign Banking Association, New York; Daniel Warren, vice-president of American Trading Co.; George M. Woolsey, of New York.

The new company will be strongly entrenched in the following markets: United States and Canada, England, the Continent and Scandinavia, Japan, China, Australia, New Zealand, the Straits Settlements, South Africa, Cuba, Mexico, Argentina, Brazil and the other Central and South American countries.

Through the medium of the offices in the United States American staple commodities and manufactured goods continue to be exported to all parts of the world, and in like manner the products of foreign countries imported for distribution in the United States and other countries.